**[4910-13]**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 450**

**[Docket No. FAA–1999-6265 ; Notice No. 99-17]**

**RIN 2120-AG76**

**Financial Responsibility Requirements for Licensed Reentry Activities**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The Commercial Space Act of 1998 (CSA) directs the FAA to establish financial responsibility requirements covering risks associated with the licensed reentry of a reentry vehicle. The FAA would determine, on an individual basis, the amount of required insurance or other form of financial responsibility after examining the risks associated with a particular reentry vehicle, its operational capabilities and designated reentry site. This proposal provides general rules for demonstrating compliance with insurance requirements and implementing statutory-based Government/industry risk sharing provisions in a manner comparable to that currently utilized for commercial launches.

**DATES:** Comments must be received by December 6, 1999.

**ADDRESSES:** Comments on this document should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA–1999-6265, 400 Seventh Street, SW., Room Plaza 401, Washington, DC 20590. Comments may be filed and examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays, except Federal holidays. Comments also may be sent electronically to the Dockets Management System

(DMS) at the following Internet address: http://dms.dot.gov/. Commenters who wish to file comments electronically, should follow the instructions on the DMS web site.

**FOR FURTHER INFORMATION CONTACT:** Ms. Esta M. Rosenberg, Attorney-Advisor, Regulations Division, Office of the Chief Counsel, Federal Aviation Administration, U.S. Department of Transportation (202) 366-9320.

**SUPPLEMENTARY INFORMATION:**

**Comments Invited:**

Interested persons are invited to participate in the making of the proposed action by submitting such written data, views, or arguments, as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this document also are invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket or notice number and be submitted in duplicate to the DOT Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered by the Administrator before taking action on this proposed rulemaking. Comments filed late will be considered as far as possible without incurring expense or delay. The proposals in this document may be changed in light of the comments received.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this document must include a pre-addressed, stamped postcard

with those comments on which the following statement is made: "Comments to Docket No. FAA–1999-6265." The postcard will be date stamped and mailed to the commenter.

**Availability of NPRMs**

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: (703) 321-3339) and the Government Printing Office (GPO)'s electronic bulletin board service (telephone: (202) 512-1661).

Internet users may reach the FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm or the GPO's web page at http://www.access.gpo.gov/nara access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267-9680. Washington, DC 20591, or by calling (202) 267-9680. Communications must identify the notice number or docket number of this NPRM.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 11–2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

**Background**

The Commercial Space Act of 1998 (CSA), Public Law 105-303, grants new authority to the Secretary of Transportation over the licensing and regulation of reentry vehicle operators and the operation of reentry sites by a commercial or non-Federal entity. In addition to licensing launches of expendable launch vehicles and the commercial

operation of launch sites, the Secretary is now authorized to license reentries and the operation of reentry sites when those activities are conducted within the United States or by U.S. citizens abroad. Statutory objectives in licensing reentry activities are to ensure that public health and safety and the safety of property are not jeopardized as a result of reentry activities and consistency with U.S. national security and foreign policy interests, including treaty obligations entered into by the United States.

Responsibility for commercial space transportation has been assigned by the Secretary of Transportation to the Administrator of the Federal Aviation Administration (FAA), who in turn has delegated regulatory and related authority over commercial space transportation to the Associate Administrator for Commercial Space Transportation (AST).

On April 21, 1999, the FAA issued proposed rules governing licensing and other regulatory requirements applicable to non-Federal reentry activities. See 64 FR 19626-19666. Referred to herein as the Reusable Launch Vehicle or RLV Licensing Regulations, the proposed rules explain the agency's comprehensive approach to evaluating RLV mission risk and provide additional insight into the FAA's regulatory objectives in licensing reentry. The comment period closed on July 20, 1999. Intended as a companion document to the RLV Licensing Regulations, this rulemaking elaborates upon the FAA's proposed approach to licensing launch and reentry of an RLV or other reentry vehicle. It does not reflect a final determination by the FAA on the scope and characteristics of an RLV licensing program.

In addition to granting reentry licensing authority, the CSA further amends 49 U.S.C. Subtitle IX, chapter 701, popularly referred to as the Commercial Space Launch Act of 1984 (CSLA), by extending existing requirements for financial responsibility and

risk allocation to licensed reentries. In doing so, Congress has committed the Government to share in the operational risks associated with development and use of reentry technology for commercial purposes.

Under the amendments, both the burdens of the CSLA risk allocation scheme and its benefits apply to licensed reentries. Perhaps of greatest significance to prospective reentry vehicle operators is congressional affirmation in the newly enacted legislation that the payment of excess claims (or "indemnification") provisions of 49 U.S.C. 70113 apply to a licensed reentry just as they do to a licensed launch. Unaffected by the Commercial Space Act of 1998, however, is the existing sunset provision that appears in 49 U.S.C. 70113(f), limiting eligibility for Government indemnification to reentries conducted under a license for which a complete and valid application has been received by the FAA by the end of 1999. [1]

On August 26, 1998, the agency issued final rules implementing CSLA financial responsibility (insurance) and risk allocation requirements for licensed launch activities. 63 FR 45592-45625. The final rules, codified at 14 CFR Part 440, establish in regulations a risk-based approach, known as maximum probable loss (MPL) methodology, to determining insurance requirements. Included in part 440 are requirements for insuring loss or damage to government range property and for liability insurance providing coverage for all launch participants, including the U.S. Government, in the event of claims by a third party for damage or loss resulting from licensed launch activities. The final rules also implement statutory requirements for reciprocal waivers of claims among launch participants whereby each participant is required to waive certain claims it may have for damage or loss against each of the other launch participants and

accept financial responsibility for losses suffered by its own personnel. And, in accordance with the CSLA, the final rules reflect the U.S. Government's participation in statutorily directed risk allocation through the reciprocal waiver of claims and by providing for payment of certain third party claims, subject to congressional appropriation of funds. Under the CSLA, the government may cover or "indemnify" third-party liability of all launch participants when liability exceeds required insurance, up to a statutory ceiling of $1.5 billion (as adjusted for inflation after January 1, 1989) above insurance.

As indicated in the financial responsibility rulemaking for licensed launch activities, the risk-sharing scheme enacted in 1988 and recently extended to cover licensed reentries benefits the aerospace industry, including customers of commercial launch and reentry services, as well as the government. The aerospace industry is relieved of the risk of catastrophic liability which would be difficult and costly, if not impossible, to manage with private insurance if each launch participant had to obtain $2 billion of coverage.[2] The government benefits from the statutory risk sharing scheme through CSLA-mandated liability coverage, up to a defined amount, which financially insulates the government from its own risk of liability exposure including liability for certain damage on the ground or to aircraft in flight when the United States is deemed a launching State under the terms of the Outer Space Treaties, specifically the Convention on International Liability Caused by Space Objects (Liability Convention, entered into force September 1972). Liability for damage caused elsewhere, such as to satellites on orbit, is also assigned to the government under the Liability Convention if it is the fault of persons for whom the launching State is responsible. In addition, under Article VI of the

[1] If enacted, pending legislation would extend the sunset provision an additional five to ten years.

Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty, entered into force October 1967), the United States bears international responsibility for activities carried on in space by non-governmental entities.

Risk allocation under the CSLA contemplates the following quid pro quo arrangement. A launch or reentry licensee provides insurance covering the first tier of risk for all entities, including the government, involved in licensed space launch or reentry activity. In return, the government agrees to be responsible for its own liability and that of launch or reentry participants, subject to Congressional appropriation of funds, up to an additional $1.5 billion (with an adjustment for post-January 1, 1989 inflation). The commercial space transportation industry is thereby relieved of the risk of catastrophic losses within the second tier of risk (statutorily required insurance plus $1.5 billion, as adjusted for post-January 1, 1989 inflation). The third tier of risk, or claims in excess of the combined total of required insurance plus $1.5 billion (as adjusted), is the responsibility of the party adjudged by a court to be legally liable for the claims. As a regulatory matter, the agency imposes financial responsibility for the third tier of risk on the launch licensee, and in this notice proposes to do likewise with respect to a reentry operator or licensee, unless it has no liability whatsoever for such claims.

**The COMET/METEOR Experience**

The authority granted by the Commercial Space Act of 1998 (CSA) is the culmination of several years of Administration effort to grant specific licensing authority to the Department of Transportation over reentry of a reentry vehicle. The agency's

[2] The amount of $2 billion represents the amount of indemnification that may be made available to launch participants without adjusting for inflation, or $1.5 billion, added to the maximum amount of liability

efforts began in 1993, when its evaluation of the COMET reentry vehicle highlighted the limitations of the CSLA in keeping pace with advancements in technology.

COMET, or the Commercial Experiment Transporter, began as a commercial program administered through the National Aeronautics and Space Administration's (NASA's) Centers for the Commercial Development of Space. COMET was intended to provide a low cost, medium-term (30 day) platform in space for the conduct and return to Earth of microgravity experiments. (The COMET Program and the agency's approach to authorizing its activity are described in several Federal Register Notices. See 57 FR 10213, March 24, 1992; 57 FR 55021, November 23, 1992; and 60 FR 39476, August 2, 1995.) Initially, three operators were involved and required agency regulatory oversight with respect to public safety-related operations. EER Systems, Inc., was responsible for placing in orbit the COMET reentry vehicle system, known as the Freeflyer, using a Conestoga expendable launch vehicle. Westinghouse Electric Corporation was responsible for operation of the service module, the component of the Freeflyer that would remain operational while on orbit for an additional 180-day period. Upon command from Earth, the Freeflyer would separate into two components and the reentry vehicle portion, designed and operated by Space Industries, Inc., would reenter Earth atmosphere targeting a designated landing site on Earth where experiments could be recovered.

Criteria utilized by the agency in evaluating reentry safety are described in a Federal Register Notice (57 FR 10213, March 24, 1992), and the agency's experience in implementing the criteria is recounted in the related notice of proposed rulemaking referred to herein as the RLV Licensing Regulations. The COMET Program was

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insurance that may be required under the terms of 49 U.S.C. 70112(a)(3)(A), or $500 million.

terminated due to funding problems but was subsequently resurrected under a NASA contract. EER Systems, Inc. became responsible for both launch and reentry operations. Capability of the reentry vehicle system, renamed METEOR, was never demonstrated, however, because of the Conestoga launch failure which destroyed the METEOR system shortly after lift-off.

Initially, the agency's approach to the COMET Program was to license the reentry event separately from the launch event under its existing authority to license the launch of a launch vehicle on a suborbital trajectory. The determination to issue a separate license for return to Earth of the reentry vehicle was based, in large measure, on the fact that the reentry vehicle operator's identity was different from that of the launch operator, and that responsibility over the subsequent reentry (30 days following completion of the launch) ought not be imposed regulatorily on the launch operator whose responsibility for launch safety would terminate upon safing of the Conestoga expendable launch vehicle upper stage.

By letter from the House Chairman of the Subcommittee on Space to the Director of the Office of Commercial Space Transportation or OCST (the predecessor office to FAA's Associate Administrator for Commercial Space Transportation or AST), OCST was advised that it did not have explicit licensing authority over payloads but that it should continue its safety review of reentry vehicle operations associated with the launch.

In the September 2, 1992 letter, the House Subcommittee Chairman indicated that the Committee would seek legislation addressing commercial reentry vehicle licensing issues, including indemnification and liability.[3] OCST continued its evaluation of the

[3] Implicit in the House Subcommittee letter, and made explicit in congressional report language accompanying passage of the CSA (as well as predecessor legislation), is rejection by the House Committee

COMET Freeflyer, and then METEOR, under its authority to evaluate missions and payloads not otherwise licensed by the Federal government, for purposes of assuring that its launch would not jeopardize public safety. In the meantime, OCST was further advised by House Subcommittee staff that claims for loss or damage resulting from reentry of the COMET reentry vehicle would not be eligible for indemnification because there was no authority to indemnify claims resulting from operation of a payload absent a clear causal nexus to the launch event. Accordingly, as a condition of NASA's contract with EER Systems for the conduct of microgravity research and experimentation services, NASA required insurance covering the government's potential liability, including that arising under the Outer Space Treaties, as a result of the reentry. The amounts of reentry liability and government property insurance established by NASA as a condition of its contract were the same requirements as OCST had ordered for the Conestoga launch using MPL methodology although OCST had not addressed reentry risk in its assessment of financial responsibility requirements for launch.

Each year since 1993, the Administration has proposed, and Congress has acted favorably upon, authorizing legislation that would allow the agency to license reentry operations and establish MPL-based insurance requirements for licensed reentries. In 1998, legislation was finally enacted authorizing the agency's regulatory responsibilities for reentry licensing and risk management.

**Risk-Based Insurance**

In 1995, the agency completed a study evaluating the sufficiency and applicability of CSLA financial responsibility requirements to licensed reentry operations. The study

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on Science of the notion that the return to Earth of a launch vehicle on a suborbital trajectory is separately licensable as a launch under the agency's longstanding launch licensing authority.

evaluated the adequacy and appropriateness of using risk-based methodology, known as maximum probable loss (MPL), in establishing liability and government property insurance requirements for reentry using a COMET-type reentry vehicle as a model. MPL has been used successfully by the agency since 1989 in determining insurance requirements for launch operations, including preparatory activities conducted at a launch site and flight of a launch vehicle. The study also evaluated whether statutory ceilings on launch insurance requirements ($500 million for liability and $100 million for government property) would be adequate for reentry operations. Finally, the study explored whether insurance capacity existed in the market to underwrite required coverages at reasonable cost.

The study's findings were favorable on all accounts. MPL methodology was determined to be appropriate and adequate for assessing reentry risk and statutory ceilings on insurance requirements were found appropriate to cover reentry risk. The study concluded that if the $500 million liability ceiling were not sufficient to adequately address the liability risk that attends reentry activity then perhaps the reentry proposal under review would prove too hazardous to be authorized by the agency.[4] In this manner, risk assessment functions as an indicator of acceptable risk in carrying out the agency's public safety responsibilities, as well as providing the basis for financial responsibility requirements. Whether the activity under consideration is launch or reentry, if MPL assessment would yield an unusually high value (as compared with other authorized space

[4] For example, assigning $3 million as the value of life used for purposes of determining maximum probable loss, as explained in the notice of proposed rulemaking regarding financial responsibility for licensed launch activities (61 FR 38992-39021, at 39007, July 25, 1996), the maximum allowable liability insurance requirement under the CSLA or $500 million, would account for an event resulting in 167 casualties, assuming no property damage. If a sufficiently probable event were associated with a reentry proposal that would result in such significant casualties it would not pass muster under the FAA's safety review and would therefore not qualify for reentry licensing.

activities) the FAA believes it may signal the need to mitigate further the risks associated with a proposed space transportation activity before a license would be granted, to ensure that risks to public safety are confined to a reasonable level.

**Reentry Technology and Reusable Launch Vehicles (RLVs)**

The licensing authority granted by the Commercial Space Act of 1998 (CSA) allows for separate licensing of launch and reentry vehicle operators, as in the initial COMET proposal, but is equally applicable to reusable launch vehicle (RLV) concepts undergoing design reviews and testing protocols at the end of the 20th century.

Certain reusable or partially reusable launch vehicle concepts currently under development are reentry vehicles, as defined by the CSA; however, they bear little resemblance to the COMET/METEOR reentry vehicle evaluated by AST in the early 1990's. Whereas COMET/METEOR was to be launched as a payload and was intended to provide a microgravity platform for medium-term experimentation (30 days or more of on-orbit microgravity environment before intact reentry), the majority of reentry concepts today are intended to respond to projected growth in the telecommunications satellite services industry and other demands for lower cost access to low Earth orbit. Constellations of satellites in low Earth orbit (LEO) provide mobile telecommunications capabilities and are responsible for 71 percent of forecasted launches over the next 12 years. See 1999 Commercial Space Transportation Forecasts, issued by the FAA and the Commercial Space Transportation Advisory Committee (COMSTAC). Demand for such services, including replenishment of large and small LEO constellations, account for market projections of 975 to 1,195 payloads to be launched in the next 12 years. RLV concepts are targeting the anticipated surge in launch activity that will be required to maintain constellation services and intend to obtain market share by offering faster and cheaper launch services.

Reentry vehicle and RLV concepts vary widely. Some, like VentureStar, present single stage to orbit capability while others, such as Kistler Aerospace Corporation's K-1

vehicle, contemplate use of multiple stages to perform payload delivery services. Other RLV concepts, such as that under development by Kelly Aerospace, rely on aircraft technology and airborne launch-assist concepts in combination with more conventional rocket motor technologies to attain desired altitude and destination. Airborne launch systems are not new to the world of commercial aerospace launch concepts, however. The Pegasus launch system, carried aloft by a modified L-1011 aircraft, has a proven record of providing reliable expendable launch vehicle services.

**RLV Launch and Reentry Financial Responsibility**

Mission approach.

The RLV Licensing Regulations describe the FAA's proposal to fulfill its safety mandate in a manner that accommodates developments in RLV technology and industry needs. The FAA proposes to retain discretion to grant both launch and reentry authorizations in a single RLV mission license using a measure of safety for vehicle operations consistent with that currently employed for launches of expendable launch vehicles at Air Force ranges. Both ascent and descent flight phases must be evaluated and authorized by the FAA in accordance with FAA safety criteria for the mission; however, launch and reentry authorizations or licenses may be combined in a single license document. Application of a combined risk measure to ascent and descent flight phases of a launch vehicle reflects the FAA's determination that the public should not be exposed to greater safety risk in accomplishing a round-trip mission using an RLV to place a payload in orbit. Nor should the public be exposed to greater risk by virtue of the vehicle's ability to achieve Earth orbit or outer space before landing on Earth. See 64 FR at 19631. The FAA's proposed mission approach to licensing an RLV operator is

explained in detail in the proposed RLV Licensing Regulations issued for public comment on April 21, 1999. See 64 FR 19626-19666.

Occurrences during both launch and reentry must be covered through financial responsibility provided by the licensee, up to required amounts. As amended by the CSA, 49 U.S.C. 70112(a) directs the agency to establish financial responsibility requirements that accompany a license authorizing launch or reentry, up to statutory ceilings (currently, $500 million for third party liability and $100 million for government property damage). Up to $500 million of liability insurance may therefore be required for launch of an RLV, based upon the FAA's determination of the maximum probable loss that may result from launch, as well as up to $500 million of liability insurance to cover third party liability resulting from its reentry.

The government shares in launch and reentry risks through the payment of excess claims, or so-called "indemnification,"[5] provisions set forth in 49 U.S.C. 70113, which provide for payment by the government of claims related to a launch or reentry in excess of required insurance. In accordance with the quid pro quo arrangement contemplated by the statute, an RLV operator would be eligible for indemnification of excess third party claims that result during either, or both, the launch phase of licensed RLV flight and its reentry. Accordingly, it is necessary to define the scope of licensed launch activities, as distinct from licensed reentry activities, involved in an RLV mission in order to allocate risk and assign financial responsibility requirements to the appropriate phase of licensed flight and to clarify how the government is expected to share in launch or reentry risk through its indemnification responsibilities under 49 U.S.C. 70113(a).

A seamless approach to RLV mission regulation is envisioned for most of the RLV concepts currently under development and, similarly, seamless financial responsibility requirements would generally apply as well. The FAA is proposing a flexible approach to accomplishing this result. A license order may distinguish launch financial responsibility requirements from reentry financial responsibility requirements where, for example, risks presented by launch of a fully fueled vehicle differ in nature or magnitude from those presented by reentry of an RLV that has expelled all or nearly all of its explosive propellant and capability. Alternatively, the FAA may find that a uniform level of financial responsibility is sufficient to cover both launch and reentry risk, although insurance must be available to respond to claims that arise during both launch and reentry, up to the required amount for each phase of licensed flight.

The agency reserves authority to determine, on a case-by-case basis, whether to establish differentiated insurance requirements for RLV launch as opposed to reentry of an RLV from Earth orbit or outer space. Circumstances in which it would be appropriate to do so include launch at one site with reentry to a different site because different populations would be exposed to launch vehicle risks yielding potentially different MPL valuations. Also, the FAA understands that an RLV may be greater in size, blast capability and explosive potential during ascent than descent if it will shed stages, as would the Kistler K-1 vehicle, before achieving orbit and subsequently reentering into Earth atmosphere. Moreover, an RLV would be fully fueled for launch whereas it would have exhausted or expelled all or most of its hazardous propellants before planned landing on Earth. On the other hand, launch risks can be mitigated by ensuring that the

[5] Commonly referred to as "indemnification," the payment of excess claims provisions of 49 U.S.C. 70113 provide procedures whereby Congress may enact legislation appropriating funds to cover liability of launch

vehicle's instantaneous impact point (the point on Earth where vehicle and debris impact would be realized in the event of a flight failure such as loss of thrust or vehicle break-up) remains over unpopulated areas or has no significant dwell time over any populated area, whereas reentry risks are, at least in some part, a function of vehicle reliability and size of the targeted landing site. (The related RLV Licensing Regulations explain the FAA's proposed requirements for assessing the adequacy and suitability of a proposed reentry site.) Where launch and reentry risks are comparable in magnitude, however, the FAA may impose parallel requirements for launch and reentry.

In any case, because an event could occur during both launch and reentry, particularly where multiple stage vehicles are used, financial responsibility must be available to respond to claims arising during either or both flight phases. Having uniform or consistent insurance requirement in place over the course of the mission is not intended to limit responsibility of the licensee to cover the liability that results from an RLV mission.

The agency requests public comment on its approach to assessing risk for RLV operations in light of the FAA's proposed mission approach to RLV licensing, that is, whether it is reasonable and prudent to separately assess and establish insurance requirements based upon launch or ascent risks as distinct from reentry or descent risks, and the circumstances, if any, under which it would be appropriate to do so. Comments are requested on whether insurance determinations that distinguish launch from reentry would hinder, rather than help, claims settlement.

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participants that is in excess of the amount of insurance required under 49 U.S.C. 70112(a)(1)(A).

Scope of RLV Launch Authorization.

Financial responsibility requirements applicable to RLV launches are provided in 14 CFR Part 440, whose requirements are intended to address launch anomalies and losses resulting from a licensed launch. Losses that result from or are causally related to performance of the launch vehicle during its ascent would be addressed through part 440 requirements and eligible for indemnification under 49 U.S.C. 70113, when they exceed required launch liability insurance.

The CSA amended the definition of "launch" contained in the CSLA by including within its meaning "activities involved in the preparation of a launch vehicle or payload for launch, when those activities take place at a launch site in the United States." 49 U.S.C. 70102(3). Incorporating this amendment, the FAA's recently issued licensing regulations define the term "launch" to include "pre-flight ground operations beginning with the arrival of a launch vehicle or payload at a U.S. launch site." 14 CFR § 401.5. See 64 FR 19586-19624. The RLV Licensing Regulations propose to continue use of this definition with respect to RLV launches. 64 FR at 19655.

However, the FAA has proposed a different end point, payload deployment, for purposes of defining licensed RLV launch flight from that applied to launch of an expendable launch vehicle or ELV, as described in the supplementary information accompanying the RLV Licensing Regulations. 64 FR at 19632-33. [6] (The definition of "launch" that appears in § 401.5 of the RLV Licensing Regulations erroneously fails to reflect the proposed change.) In the licensing regulations issued recently, the FAA reaffirmed that its safety mandate, which includes public safety and safety of property,

requires that it exercise licensing authority over the launch of a launch vehicle through the point after payload separation when the last action occurs over which a licensee has direct or indirect control over the launch vehicle. See Commercial Space Transportation Licensing Regulations; Final Rule, 64 FR 19586, at 19594, April 21, 1999. For launches of expendable launch vehicles (ELVs), that point typically occurs upon "safing" of the vehicle's upper stage or otherwise rendering the upper stage inert so as to mitigate sufficiently the explosive potential of any remaining energy sources on board the vehicle. Defining the end of licensed launch activity in this manner minimizes the risk and consequences of collision with other orbiting space objects as well as orbital debris generation. As previously noted, the FAA's definition of "launch" is codified at 14 CFR § 401.5.

In the RLV Licensing Regulations, the FAA has suggested using payload deployment to define the end of an RLV launch, instead of the control test applied by the FAA to define the end of an ELV launch. Reference to the licensee's last exercise of control over the launch vehicle is appropriate for ELVs but if applied to RLV technology would mean that a launch might not be concluded under the terms of the definition until reentry is complete, contrary to the CSA. Also, in order to accomplish reentry, an RLV operator would retain (or design in) certain control over the vehicle in order to ready it for reentry and energy sources would retain their explosive potential remaining capable of activation while the vehicle is on orbit. The control test is simply not appropriate for RLVs.

[6] The related rulemaking addressing RLV Licensing Regulations offers detailed guidance, summarized in this Notice, on the proposed scope of licensed launch and reentry flight phases of an RLV. See 64 FR 19626, at 19631-19633, April 21, 1999.

As discussed in the RLV Licensing Regulations, the FAA proposes instead to limit the definition of "launch" that appears in 14 CFR § 401.5 to ELV launches and to use accomplishment of the launch phase of the mission, that is, the point of payload deployment (or attempted payload deployment), to define the end of licensed launch activities when the launch vehicle is an RLV. If adopted in final rules, this definition offers the added benefit of providing a bright line reference point for distinguishing the end of licensed launch flight from other mission phases for most RLV activities that will occur in the foreseeable future.

Scope of RLV Reentry Authorization.

The CSA amends the CSLA by imposing financial responsibility requirements for RLV and other reentry vehicle reentries in a manner comparable to that required for licensed launches. Insurance or other form of financial responsibility would be required to address losses to third parties and government property resulting from a licensed reentry.

A reentry subject to FAA licensing authority means "to return or attempt to return, purposefully, a reentry vehicle [including an RLV] and its payload, if any, from Earth orbit or from outer space to Earth." 49 U.S.C. 70102(10). The proposed RLV Licensing Regulations define "reentry" to include "activities conducted in Earth orbit or outer space to determine reentry readiness and [that] are therefore unique to reentry and critical to ensuring public health and safety and the safety of property during reentry." 64 FR at 19656. The accompanying Supplementary Information further explains that licensed reentry activity would commence at the point following payload deployment when vehicle hardware and software begin to be readied for reentry. Once a payload has been deployed, RLV operations, whether designed into the vehicle or controlled from Earth,

would be directed at readying the vehicle for reentry and verifying reentry readiness of structures, propulsion systems, and vehicle orientation, attitude and safety systems, including software. See 64 FR at 19632-33. For RLVs intended to enter outer space but not Earth orbit, and for those RLVs intended to remain on orbit for a relatively brief duration, such as days or possibly weeks, the RLV Licensing Regulations provide that the licensed reentry phase of an RLV mission would therefore commence immediately following payload deployment. In such circumstances, there would be no on orbit activity that is not covered by a license and associated statutory financial responsibility requirements. In other circumstances, such as delayed reentry by design, the FAA has requested comments in the RLV Licensing Regulations on the appropriate commencement point of reentry licensing authority from a safety perspective and now solicits public comment from a financial responsibility and risk management perspective.

In proposing to include within the scope of a reentry license that period of on-orbit activity during which preparatory activities to ensure reentry readiness are conducted, the FAA considered the following: the Report of the House Committee on Science that accompanied passage of H.R. 1702, the predecessor legislation to the CSA, H. Rep. 105-347, 105th Cong., 1st Sess. (Committee Report), the scope of launch licenses for ELV launches, and reentry risks for which statutorily mandated financial responsibility and risk allocation are necessary and meaningful.

The FAA's proposed approach to defining those reentry activities that may be encompassed by a license is consistent, generally, with concerns expressed in the Committee Report. In its Report, the House Committee on Science (the Committee) indicated that "the term 'reentry' is intended to cover a wide range of activities, including the act of returning a reusable launch vehicle to Earth. In establishing the legal

framework for reentry, the Committee's approach is to treat reentry of a reentry vehicle the same as launch of a launch vehicle." H. Rep. 105-347, 105th Cong., 1st Sess., at 21. The Committee further noted that "for purposes of the license requirement, reentry begins when the vehicle is prepared specifically for reentry. By way of definition, the Committee intends the term to apply to that phase of the overall space mission during which the reentry is intentionally initiated. Although this may vary slightly from system to system, as a general matter the Committee expects reentry to begin when the vehicle's attitude is oriented for propulsion firing to place the vehicle on its reentry trajectory." Id. Specifically excluded from the intended scope of FAA licensing authority over reentry would be transportation events in space that are wholly unrelated to launch or reentry, such as maneuvers between orbits, according to the Committee Report. Id. at 22-23.

As reflected in the RLV Licensing Regulations and summarized here, the FAA also finds in the Committee's expansive definition of the term "launch" guidance that is useful and instructive in delimiting "that phase of the overall space mission during which the reentry is intentionally initiated" and to which FAA reentry licensing authority and associated financial responsibility requirements are intended to apply. Id. at 21. The Committee Report defines the term "launch" for purposes of license coverage to include activities preceding flight that entail critical preparatory steps to initiating flight, are unique to space launch and are so hazardous as to warrant agency regulatory oversight, as long as they are conducted at a launch site in the United States, even if that site is not ultimately the site of the actual launch. Id. at 22. Safety concerns over the hazardous nature of such activities underlie the Committee's rationale for extending the term "launch" to include them. To fully comprehend such activities within the scope of a launch license and to ensure fulfillment of the FAA's statutory mandate regarding public

safety and safety of property, the FAA recently issued final rules defining "launch" to include activities involved in the preparation of a launch vehicle for flight when those activities take place at a launch site in the United States, commencing upon arrival of a launch vehicle or payload at a launch site.[7] 14 CFR § 405.1. Arrival of a launch vehicle or its major components was selected by the agency to provide an appropriate and clear commencement point of FAA regulatory authority over a launch because that event generally signals a change in risks to public safety and property due to the hazardous nature of activities that occur thereafter.

Similarly, risks to public safety and to property, both on orbit and on Earth, change significantly as a result of RLV operation on orbit or in outer space due to heightened risk of an anomalous event that may result in on orbit collision, uncontrolled reentry, or other non-nominal or unplanned occurrence. Therefore, for safety reasons comparable to those underlying the FAA's determination that "launch" includes preparatory activities preceding vehicle flight, the FAA has proposed in the RLV Licensing Regulations to define "reentry" to include those "activities conducted in Earth orbit or outer space to determine reentry readiness and are therefore unique to reentry and critical to ensuring public health and safety and the safety of property during reentry." 64 FR at 19656. The event of payload deployment appropriately marks the end of licensed launch flight and would be followed immediately thereafter by reentry activities comprehended by the FAA's licensing authority. Consistent with the FAA's approach to defining "launch" of a launch vehicle, the FAA approach offers a bright line demarcation

[7] The CSA amends the statutory definition of "launch" by expressly including preparatory activities at a launch site; however, prior to the amendment the FAA proposed to include such activities in a regulatory definition "launch" in order to fulfill its safety mandate. See Notice of Proposed Rulemaking, "Commercial Space Transportation Licensing Regulations," 62 FR 13216-13273.

between the end of licensed RLV launch flight and commencement of licensed reentry activities for purposes of clarity and consistency.

Where a licensed launch would be followed immediately by a licensed reentry, a seamless risk management program would apply to all vehicle flight. A seamless approach is therefore contemplated for those vehicles launched into outer space on a suborbital trajectory and designed to reenter from outer space without ever entering an orbital path. It would also apply to those vehicles intended to spend minimal time on orbit and subsequently reenter purposefully upon activation or initiation of a reentry system once reentry readiness has been verified. CSLA-directed financial responsibility and risk allocation would cover ascent and descent flight phases of such vehicles, including flight on orbit or in outer space in furtherance of reentry readiness. However, inter-orbit maneuvers or transfer operations that are not performed as part of launch or reentry, as defined by the FAA, are not covered by the FAA's licensing authority and are therefore not intended to be addressed through statutorily mandated financial responsibility requirements. Risks associated with those activities would remain outside the CSLA financial responsibility and risk allocation program.

Non-nominal reentry.

The broad scope of reentry licensing authority proposed in the RLV Licensing Regulations is necessary, in the FAA's view, to fulfill the legislative purpose underlying statutorily-mandated financial responsibility in the first instance, that is, financial protection of launch participants, including the U.S. Government, in the event of an unplanned occurrence, such as a non-nominal or premature reentry, resulting in third party liability. It is also necessary to make eligibility for indemnification by the

government a meaningful benefit for the RLV industry in exchange for its coverage of the government's liability exposure up to a prescribed amount, at no cost to the government.

Coverage under the CSLA financial responsibility and risk allocation scheme is co-extensive with licensed activity and also addresses proximate results or consequences of licensed activity. Liability insurance under 49 U.S.C. 70112 provides coverage for claims "resulting from an activity carried out under the license;…." (emphasis added) 49 U.S.C. 70112(a)(1). Similarly, indemnification under the CSLA becomes the government's responsibility, up to the statutorily prescribed ceiling, to the extent of excess claims "resulting from an activity carried out under the license." (emphasis added) 49 U.S.C. 70113(a).

The FAA considers that its proposed scope of reentry licensing and related requirements for financial responsibility are appropriate and necessary to cover non-nominal reentries, including reentries that are premature or unplanned and therefore technically unauthorized.[8] Statutory requirements for assuring financial responsibility of the licensee and the associated indemnification of liabilities that result from licensed activities acknowledges that non-nominal events, including accidents, may in fact occur as a result of the extremely hazardous activities of launch or reentry. As with launch, licensed pre-flight activity conducted in preparation for vehicle flight, be it launch or

[8] Inclusion of the term "purposefully" in the definition of "reenter" and reentry" clarifies that the unplanned or unintended reentry of any space object that is not a reentry vehicle, as defined by the statute, is not encompassed in the agency's licensing authority. Accordingly, sections 70112 and 70113 (CSLA risk allocation) would not apply to such events unless they are clearly and causally related to a licensed launch or reentry. The agency does not believe that use of the term "purposefully" is intended to necessarily exclude premature or other non-nominal reentries. It is also not intended to exclude suborbital activities from reentry licensing coverage simply because reentry occurs ballistically or through other physical forces. In the agency's view, having the intent to return a vehicle that has been designed to reenter Earth atmosphere and remain substantially intact subjects the vehicle operator to the agency's reentry licensing authority, as long as the intended point of commencement of reentry is in outer space or the vehicle has entered Earth orbit.

reentry, creates safety risks warranting regulatory oversight by the FAA and may give rise to liability owing to its hazardous nature and attendant consequences. To adequately protect government interests, as well as to ensure financial resources exist to adequately cover launch and reentry participant liability, the FAA believes that events that precede the final initiation of reentry into Earth atmosphere, including the prospect of a non-nominal reentry, must be covered by a reentry license and associated financial responsibility and risk allocation requirements.

Non-nominal reentries may occur in a variety of ways, including premature reentry, random reentry due to a major system failure, and reentry to an alternative or abort site. Non-nominal situations that are reasonably foreseeable would be considered by the agency in licensing a planned reentry as part of the agency's safety and risk mitigation program. Similarly, a finite set of outcomes and risks that could reasonably result from on orbit operation of an RLV in anticipation of its reentry would be identified and considered in setting risk-based insurance requirements.

Non-nominal reentry does not necessarily mean uncontrolled reentry, however, although some non-nominal reentries may result in failure or inability of the operator to employ intended controls during the reentry sequence. When this situation occurs, either prematurely or at some time after a reentry attempt is aborted or perhaps abandoned, reentry may occur entirely at random, both as to time and location. For example, if under the terms of an FAA license, reentry of a reentry vehicle may only be attempted under defined circumstances (such as attainment by the vehicle of certain prescribed orbital characteristics, including attitude, system status and inclination), and the reentry licensee is unable to verify that it has satisfied the conditions necessary to conduct a licensed reentry, the licensee would be required to abort the reentry attempt because it cannot be

accomplished under the safety limitations defined in the license. However, the reentry vehicle, which has been designed to return to Earth substantially intact, may reenter Earth atmosphere as a result of forces other than intentional initiation by the licensee of a reentry sequence, much like an upper stage that remains in low Earth orbit or an inactive satellite whose useful life is spent. The RLV industry has stressed to the FAA that an unplanned, uncontrolled reentry has very little chance of causing damage or harm because, as with most space debris that reenters Earth atmosphere, it would burn up due to atmospheric drag. The FAA believes that an event of this sort may result from licensed activity and is intended to be embraced by the agency's reentry licensing authority. The risk of such an event would be included in the agency's safety analysis and its consequences comprehended by statutory financial responsibility requirements and risk allocation. Alternatively, a premature reentry may occur before the vehicle is oriented properly for propulsion firing, making adherence to license terms and conditions for an authorized reentry impossible. Under the FAA's proposed approach to reentry licensing, the consequences of such an event would likewise be subject to CSLA-based financial responsibility and risk allocation because they would result from licensed activity.

Although the FAA has proposed rigid safety requirements to ensure that the public is not exposed to unreasonable risk, as explained in the related rulemaking, RLV Licensing Regulations, the possibility remains that an unplanned event could occur resulting in claims for damage or injury in excess of risk-based insurance requirements analytically assessed by the agency. Congress has determined that indemnification shall be available for licensed reentries to provide an opportunity for development of this new industry. Therefore, although the FAA does not propose to regulate on orbit activity other than to assure reentry safety, the FAA proposes to license pre-descent activities, on

orbit or otherwise in outer space, commencing at the point of payload deployment from an RLV, and to require insurance for vehicle operations while on orbit in the event of premature, errant, or otherwise non-nominal reentry. Inclusion of preparatory activities within the definition of "reentry" is necessary for the related purposes of fulfilling the FAA's safety mandate with respect to risks to persons and property on the ground, in airspace, and on orbit, and implementing a meaningful risk management program in accordance with the CSLA.

The FAA has proposed this scope of coverage because the agency believes it is critical to the intended purpose of requiring financial responsibility and to the industry's acknowledged need for liability protection from catastrophic claims. As with licensed launch activities, financial responsibility benefits the United States by providing assured coverage for liability assumed by the government under the Outer Space Treaties, and specifically the Liability Convention, up to a required amount. Indemnification for catastrophic risks is critical to the success of the RLV industry because of the potential failure rate associated with new reentry technology.

In proposing a comprehensive approach to reentry licensing and financial responsibility, the FAA also examined alternative approaches to ensuring appropriate risk management for reentry-related risks. For example, the FAA considered how claims would be covered if there were no license in effect. In other words, if launch authorization ended upon payload deployment, and reentry authorization became effective only at the moment of intentional ignition of reentry propulsion systems, would claims resulting from a premature, non-nominal reentry be covered by statutory financial responsibility and eligible for indemnification?

As previously noted, insurance or other form of financial responsibility is required to cover claims that result from an activity carried out under a launch or reentry license. 49 U.S.C. 70112(a)(1). It therefore appears from the statutory language that licensed activity must first occur before claims may be considered to be the result or consequence of that activity. Accordingly, if no license were in effect, claims that result from unlicensed activity following payload deployment and preceding the conduct of an authorized reentry would not be covered by statutory financial responsibility and risk allocation.

Nor would statutory financial responsibility coverage apply to anything that occurs as a result of a license having been issued. If that were so, and if taken to the extreme, such an interpretation could be viewed as including manufacture of a vehicle within the scope of the statutory financial responsibility and allocation of risk program, an unintended result. Likewise, mere intent to engage in licensed activity would also not satisfy the statutory requirement, in the FAA's view. The FAA remains mindful of Committee Report language indicating restricted applicability of statutory risk allocation, as follows: "The Committee notes that these provisions [sections 70112 and 70113] apply to losses sustained as a result of licensed activities, (i.e., launches and reentries) not event or activities between launch and reentry; after reentry; or uncovered before launch." H. Rep. 105-347, 105th Cong., 1st Sess., at 23.

In proposing the comprehensive approach reflected here, the FAA also considered whether indemnification for a premature anomalous reentry should necessarily be regarded as causally related to launch of a launch vehicle. To adopt this approach, the agency would have to conclude that but for the launch of a launch vehicle the anomalous reentry would not have occurred. However, consistent with the Committee Report, the

agency does not believe that everything that follows a launch bears a sufficient causal nexus to the launch to qualify for indemnification. By corollary, not every reentry event causing damage to uninvolved persons or property should be viewed as a consequence of the launch that placed the reentry vehicle in Earth orbit or outer space. For one thing, a non-nominal reentry may take place days or months after a nominal launch. While on orbit, or as a result of the space environment, the reentry vehicle's ability to reenter as planned and the licensee's ability to conduct an authorized reentry may be impaired or prevented. It may in fact be impossible to prove the exact cause of an anomalous reentry and there may be no demonstrable relationship between performance or operation of the launch vehicle and the reentry event. In another reasonably foreseeable situation, an anomalous reentry could occur proximate in time to a perfectly nominal launch. Even if a launch anomaly affected the reentry vehicle in some manner, it may be possible, or necessary, to implement on-orbit corrections or reenter to an alternative site consistent with the authorization granted by a license. Intervening events of this nature would or could break the causal nexus that must exist between launch and subsequent damage or loss, thereby defeating eligibility for indemnification. Finally, as in the COMET situation, although it seems unlikely for RLV missions, the launch of a reentry vehicle and its subsequent reentry may be separately contracted services performed by distinct operators. Where the launch vehicle operator can prove that it has no liability for an unplanned or unauthorized reentry by another operator, there would not appear to be a sufficient causal nexus between the launch and reentry to warrant eligibility for indemnification as a result of the launch.

In light of these examples, the agency does not believe it prudent to inextricably tie reentry indemnification to launch. Although the ability of a reentry vehicle to reenter

nominally may be impaired or degraded as a result of the natural stresses of a nominal launch or an anomalous situation occurring during launch, such circumstances should not be a necessary precondition to eligibility for indemnification in the event of an unplanned reentry in the FAA's view. Accordingly, the FAA has proposed to define reentry in a manner that accomplishes its safety mandate and assures meaningful risk allocation.

As with launch indemnification, at some point the consequences of an unplanned reentry would be sufficiently attenuated from licensed activity such that indemnification would not be available to cover resultant claims. Under those circumstances, the licensee and other reentry participants would be responsible for covering the entire liability and should make appropriate provision for doing so in their risk management programs. Absent indemnification, if a reentering object causes damage on the ground or to aircraft in flight in another country, and if the United States is liable as the launching State under the Liability Convention, there is nothing to prevent the Government from seeking contribution from the responsible entity after covering its obligations under the Outer Space Treaties.

Suborbital RLV Financial Responsibility

Not all RLVs are reentry vehicles under the statutory definition. Only those that that are designed to reenter from Earth orbit or outer space substantially intact would qualify as a "reentry vehicle." 49 U.S.C. 70102(13). RLVs that achieve neither Earth orbit nor outer space would be regulated in accordance with the FAA's licensing authority over launches of launch vehicles in a suborbital trajectory. As explained in greater detail in the RLV Licensing Regulations, for the most part, the distinction between launch and reentry of an RLV that is a reentry vehicle under the statutory definition and an RLV that is not a reentry vehicle makes no difference from a safety

perspective inasmuch as the FAA is proposing a mission approach to licensing RLV operations. Under the RLV Licensing Regulations, a consistent measure of safety would apply to all RLV missions, whether the proposed activity would be subject to the agency's licensing authority over both launch and reentry or only its licensing authority over suborbital launches. Accordingly, if what goes up will come down, either by operational design or the laws of physics, the agency would not authorize the mission unless it concludes, in advance of the launch, that both ascent and descent of the vehicle may be accomplished in a manner that does not expose the public to unreasonable risk.

From a financial responsibility and risk management perspective, however, there is a difference between suborbital RLVs that are also reentry vehicles and those that are not. Where a suborbital RLV enters outer space, its launch and reentry would be subject to separate and distinct MPL determinations based upon the unique risks posed during each flight phase, although the FAA reserves discretion to impose a uniform requirement throughout licensed flight. Suborbitally operated RLVs that do not achieve outer space would be subject to a single determination of financial responsibility only, issued under 14 CFR Part 440. The FAA requests public comment on this proposed distinction in financial responsibility requirements.

Reentry Vehicle Financial Responsibility

Not all reentry vehicle operations will be performed by RLVs. A COMET-type reentry vehicle may be developed for purposes of operating in space and subsequent reentry. The Committee Report is particularly instructive regarding the extent of FAA licensing authority over launch and reentry of a reentry vehicle that is not an RLV, such as the COMET/METEOR. The COMET/METEOR reentry vehicle was intended to remain on orbit for 30 days before its reentry would be initiated, unlike the rapid turn-

around concepts currently under development for RLVs. FAA reentry licensing would be required to authorize reentry of such vehicles but not its on orbit operation, consistent with the Committee Report, and risk allocation under the CSLA would be similarly restricted to its launch and reentry and would not cover events or activities between launch and reentry.

Reentry of reentry vehicles that are not RLVs, like COMET/METEOR, may occur significantly after a launch has been concluded and unlicensed on orbit operations have occurred. Operators of reentry vehicles designed to perform on orbit operations and maneuvers independent of launch and reentry would not have the benefit of seamless financial responsibility coverage under the CSLA and must be prepared to manage liability risk entirely through private insurance. Similarly, claims that result from unlicensed activity on orbit would not be eligible for indemnification under the CSLA and therefore remain the ultimate responsibility of the operator and participants in such activities.[9] The Committee Report suggests that reentry licensing coverage would commence for such vehicles when they are prepared specifically for reentry, such as when attitude is oriented for propulsion firing to place a vehicle on its reentry trajectory. Id. at 21. For purposes of ensuring meaningful implementation of the statutory financial responsibility and risk allocation regime, comments are requested on the appropriate commencement point of licensed activities for reentry vehicles that are not RLVs.

[9] The United States accepts fault-based liability as a launching State under the Liability Convention for damage to another launching State's on orbit space object if the damage is the fault of the government or persons for whom the United States is responsible. Liability Convention, Article III. Absent a clear causal nexus to a licensed launch or reentry, statutory risk allocation provisions, including indemnification, would not apply to cover liability of launch or reentry participants to third parties for on orbit damage. Where the statute does not apply, the government may fulfill its treaty obligations and seek contribution from those entities at fault for the damage.

**Section-by-Section Analysis**

The FAA proposes to issue financial responsibility regulations for licensed reentry activities in a form that, for the most part, parallels regulations governing financial responsibility for licensed launch activities (14 CFR Part 440 or part 440). The reason for doing so is practicality, not expediency. Principles of fairness, logic and consistency suggest that the FAA attach financial responsibility and risk allocation requirements to reentry, including the descent phase of an RLV mission, in a manner consistent with that applied to launches. For purposes of soliciting public comment on reentry financial responsibility, the FAA proposes a new part substantially mirroring part 440 requirements instead of adding reentry coverage to part 440. The FAA reserves discretion to merge the two parts in a final rule, however. Doing so would not represent a substantive change from the proposed approach and would not result in a second comment period.

The FAA also will reserve discretion to establish uniform launch and reentry financial responsibility requirements for an authorized RLV mission and separate insurance requirements for launch as distinct from reentry when a basis for doing so is identified. Factors that may make it appropriate to distinguish launch risk from reentry risk for financial responsibility purposes include disparity between launch and reentry MPL values, different vehicle operators for launch and reentry, and sufficient separation between launch and reentry functions such that risks are sufficiently independent of one another for risk management and insurance purposes. Launch MPL may be vastly different from reentry MPL if, for example, the launch site is in an unpopulated area with no population overflight contemplated and return to the designated reentry site involves some population overflight, or if launch risks include significant explosive potential

while reentry risks involve very little risk of break up or explosion, or if launch involves toxic propellants and reentry would occur with little or no propellant remaining on board the vehicle.

To facilitate the FAA's ability to impose either uniform insurance requirements for all flight phases of an RLV mission or differentiated requirements to correspond to flight phase risks, the FAA finds it prudent to propose reentry financial responsibility requirements parallel in structure to those contained in 14 CFR part 440. Although launch and reentry insurance requirements may, under certain circumstances, be differentiated in the license, the FAA reiterates that a single license is envisioned combining the launch and reentry authorizations required for the conduct of an RLV mission.

By proposing a new part 450, the FAA intends to apply to reentry the principles of financial responsibility and risk allocation established in 14 CFR Part 440. The interested public is directed to the rulemaking activity associated with issuance of final rules governing financial responsibility for licensed launch activities for discussion and thorough analysis by the FAA of those principles. See Notice of Proposed Rulemaking (NPRM), Financial Responsibility Requirements for Licensed Launch Activities, 61 FR 38992-39021, issued July 25, 1996, and Final Rule, 63 FR 45992-45625, issued August 26, 1998 (referred to herein as Part 440 Final Rule). Both documents are available by accessing the FAA's web site at http://www.ast.faa.gov. Persons unfamiliar with requirements for liability insurance coverage, reciprocal waivers of claims, and distinctions established by the FAA between private party launch participants (PPLPs), Government launch participants (GLPs), and the employees of each, involved in licensed

activities, among other things, should refer to the part 440 rulemaking in assessing this proposal and submitting comments.

Highlighted in the discussion below are the unique characteristics of financial responsibility and risk allocation when considered in the context of a licensed reentry or RLV mission.

Section 450.1 -- Scope of part; basis

Section 450.1 identifies authorized reentry activities as the subject of the notice. A licensed operator of a reusable launch vehicle subject to the FAA's reentry licensing authority would be subject to financial responsibility requirements covering launch and reentry and must therefore satisfy both part 440 and part 450 requirements. These requirements may be combined in a single license order.

Section 450.3 -- Definitions

Section 450.3 proposes to define regulatory terms in a manner consistent with 14 CFR Part 440.

Certain terms defined in 14 CFR 440.3 refer to entities or persons involved in licensed launch activities or launch services for such activities. Persons or entities involved in licensed launch activities or launch services are identified as such in § 440.3 “definitions” because they obtain a certain status under the Part 440 regulations, including that of additional insured or participant in the reciprocal waiver of claims agreement required for licensed launch activities. Where a licensed reentry will follow a licensed launch, as in the conduct of an RLV mission that achieves Earth orbit or outer space, the FAA believes that persons and entities involved in either flight phase may be potential defendants in the event of third-party claims for injury, damage or loss, arising out of the mission, regardless of when the claim arises. That is, participants in the launch phase

may be potential defendants in the event of claims resulting from an errant reentry and insurance covering their liability exposure to third parties must also be provided. Similarly, claims for damage or loss may arise among launch and reentry participants and a comprehensive inter-party waiver of claims encompassing launch and reentry participants is proposed in this notice to minimize the universe of claims for which CSLA-based insurance must be provided. Accordingly, the proposed regulations are designed to ensure that participants in all licensed mission flight are included within the intended embrace of financial responsibility and allocation of risk requirements during launch or ascent as well as reentry or descent. Because launch and reentry licensees for any particular mission are expected to be the same entity for the foreseeable future, this approach should be non-controversial and easy to implement.

Theoretically, any private party that is sufficiently involved as to be a named defendant in the event of litigation arising out of loss or damage to third parties would be comprehended by required coverage as a "licensee," "customer" or "contractor or subcontractor." To ensure this result, the FAA proposes to make explicit requirements for extending reentry coverage to participants involved in associated launch activities.

The definition of "contractors and subcontractors" in part 440 is already sufficiently broad as to comprehend entities and persons involved in licensed reentry other than a customer or the government and its agencies because it includes suppliers of property, services and component manufacturers of a launch vehicle or payload. However, unless made explicit, it is not sufficiently clear that contractors involved in licensed reentry activity would necessarily include contractors involved in a licensed launch. The proposed definition in § 450.3(a)(2) therefore includes contractors and subcontractors involved in licensed launch activity associated with a particular reentry.

Reference to contractors and subcontractors throughout the regulatory text is therefore intended to include those entities involved in licensed launch activities related to a reentry. The FAA understands that this reference may not be obvious to persons unaccustomed to FAA regulations and has endeavored to include specific reference to such entities for purposes of facilitating public comment on the proposal.

The term “customer,” as proposed, would also include a launch services customer as this entity may also confront liability exposure and is at risk of inter-party litigation by virtue of having procured launch vehicle services.

The term “Government personnel” is likewise similar to that contained in 14 CFR 440.3(a)(6), except that, for the reasons set forth above, it would also cover employees of the United States, its agencies, and its contractors and subcontractors involved in licensed launch activities associated with a particular reentry.

The term "third party" has been discussed at great length in the Part 440 Final Rule. The interested public is referred to the discussion in 63 FR at 45597-98, and 45603-07. Under the approach outlined immediately above, involvement in either the launch or reentry phase of flight removes an entity, but not its employees, from the "third party" classification. Consistent with the part 440 definition of “third party,” employees of such entities are third parties; however, claims of employees of private party participants in a licensed reentry are intended to be addressed through reciprocal waiver of claims agreements and their employer’s assumption of responsibility for such claims, as described below in the discussion of proposed § 450.17. Hence, such claims would not be covered claims for which liability insurance is required under this proposal. However, as explained in the Part 440 Final Rule, claims of Government personnel, a

defined term, must be covered by the licensee's liability insurance up to the required limit.

With the development of RLV technology comes the possibility of crewed or piloted launch vehicles whose operations would be subject to FAA licensing. For purposes of financial responsibility and risk allocation, the FAA regards the crew of a launch vehicle as employees of a private party launch or reentry participant (PPLP or PPRP, respectively) and therefore financial responsibility for their claims for damage, injury or loss would be addressed through reciprocal waiver of claims the same as claims of other PPLP or PPRP employees.

One additional class of persons not previously considered involves passengers who may, in the future, buy a ride on an RLV. The allure of space tourism is growing in popularity and the agency anticipates receiving launch and reentry licensing proposals for passenger-carrying space vehicles. Although it is premature to establish official FAA policy on the nature of the regulatory program that would be required to address passenger safety issues in space, the FAA is interested in the public's views on the subject and, for purposes of a future rulemaking, how passenger risk should be allocated. For example, should passengers be regarded as any other customers who are expected to waive claims against other participants for injury, damage or loss as a result of launch or reentry? Should the Government play a role in establishing limits on liability for injury to space vehicle passengers? Should indemnification be extended to cover risks of liability to passengers?

Section 450.5 – General

The conduct of authorized reentry activities would be subject to compliance by the licensee with financial responsibility and risk allocation requirements. Proposed

§ 450.5(a) would establish in a regulation that compliance with part 450 requirements is a prerequisite to the conduct of a licensed launch involving a reentry as well as a licensed reentry.

Section 450.5(b) reflects the FAA's intent to continue its current practice of establishing required amounts of insurance in license orders, reserving the right to make necessary modifications to those requirements prior to reentry.

The FAA's need for flexibility in setting insurance amounts is intended to address changes in liability and property risks that may occur over the multi-year life of an operator license, or if more specific performance data is learned about a vehicle's performance over time to warrant reassessment of failure consequences. It is not intended as a means of shifting risk from the government to industry after vehicle flight has been initiated.

A parallel requirement to that proposed in § 450.5(b) appears in 14 CFR 440.5(b) and prompted industry concern that the FAA would vary requirements mid-flight. Such concerns are unfounded. The FAA intends to issue and require compliance with reentry insurance requirements before launch of a reentry vehicle occurs. The FAA does not envision changed requirements once launch of an RLV or reentry vehicle occurs but before its reentry is initiated. The agency is aware that it would probably be difficult at best or prohibitively costly to obtain greater insurance coverage for reentry in the event of a launch anomaly or on-orbit situation that may affect reentry accuracy. Under either scenario, either the FAA or the licensee operating under its own procedures, may determine that a reentry attempt must be aborted on orbit if a significant threat to public safety is presented after launch of the reentry vehicle is completed, as defined in licensing regulations. A launch or on orbit failure affecting reentry risk is a reasonably foreseeable

event and would be addressed through the agency's risk-based methodology for establishing insurance requirements.

As with launch financial responsibility, § 450.5(c) establishes that a reentry licensee remains responsible for liability, loss or damage sustained by the United States, even if the licensee has made an adequate demonstration of coverage under part 450, subject to four specific exceptions. The four exceptions are as follows: (1) liability, loss or damage sustained by the United States results from willful misconduct by the United States or its agents; (2) covered third-party claims, as explained in greater detail in the discussion of proposed § 450.9, arising out of any particular reentry exceed the amount of required insurance and do not exceed $1.5 billion (as adjusted for post-January 1, 1989 inflation) above that amount and are payable under 49 U.S.C. 70113 and part 450; (3) loss or damage to government property covered under § 450.9(e) exceeds the required amount of insurance and does not result from willful misconduct of the licensee; and (4) in the event the licensee has no legal liability for claims that exceed required insurance under § 450.9(c) plus $1.5 billion (as adjusted for post-January 1, 1989 inflation).

In proposing regulations that parallel § 440.5(c) of part 440, the FAA continues to hold the licensee responsible for reentry-related liability within the third tier of risk, that is, liability in excess of the amount of risk-based insurance established by the agency plus the amount of indemnification that would be available under 49 U.S.C. 70113 if Congress appropriates funds for that purpose. Industry concerns over regulatory assignment of liability were registered and responded to by the agency in the rulemaking covering financial responsibility for licensed launch activities. See Part 440 Final Rule, 63 FR 45592, Aug. 26, 1998. The FAA continues to maintain that the Government must have a responsible party that it can look to in the event the Government is confronted with

catastrophic liability under the Outer Space Treaties and believes that it is reasonable to require participants in launch and reentry activities to absorb the cost of obtaining additional coverage for the third tier of risk. Such costs may be distributed among launch and reentry participants, including customers.

Section 450.5(d) reflects the FAA's regulatory policy that failure to comply with part 450 requirements can result in license suspension or revocation as well as civil penalty enforcement action.

Section 450.7 – Determination of maximum probable loss

Section 450.7 would extend, in regulations, application of maximum probable loss methodology to licensed reentry activities. The NPRM on Financial Responsibility for Licensed Launch Activities, 61 FR 38992-39021, describes in extensive detail the assumptions and risk assessment tools employed by the FAA in calculating the maximum probable loss or MPL that may reasonably be expected to result from a licensed launch. Persons interested in MPL methodology are referred to the NPRM, 61 FR at 39004-39007. Because a similar approach to reentry MPL would be utilized by the agency that explanation is not repeated here.

In summary, MPL establishes in a dollar amount the value of the maximum magnitude of loss for bodily injury or property damage that is sufficiently probable to warrant financial responsibility protection as a regulatory matter. Separate MPL studies are conducted for government property loss or damage and for third-party injury, loss or damage inclusive of government personnel as defined in § 450.3 but not inclusive of employees of other participants in licensed activity.

The FAA proposes to use the same probability thresholds of occurrence for reentry as currently apply to launch failure and accident scenarios and would establish

insurance requirements for consequences falling within those threshold probabilities. They are defined in § 450.3(11).

A study conducted by the agency and issued in May 1995 confirms that use of the FAA's MPL methodology in assessing launch risk is appropriate for reentry and that the threshold probabilities of occurrence used for launch MPL would be appropriate in determining reentry MPL. The study, entitled "Financial Responsibility for Reentry Vehicle Operations," considered a COMET or METEOR capsule-type of reentry vehicle, as opposed to a reusable launch vehicle; however, the FAA concludes the study's findings remain equally applicable to RLV technologies currently under the agency's consideration. In fact, enhanced maneuverability and controllability of RLVs may result in lower MPL determinations because of tighter landing footprints and the ability to compensate for errors introduced due to wind and environmental factors, among other things. The study is available on the FAA/AST home page.

An interesting observation made in the study indicates that if an MPL determination is extremely high in dollar value it may signal that the proposed activity is too risky from a public safety perspective to be authorized by the FAA and that additional risk mitigation measures may be necessary to ensure risks to the public are appropriately managed.

Contrary to current thinking, the study also assumed that because an uncontrolled reentry would not be an authorized event it was outside the scope of the MPL determination. Nevertheless, it did forecast (properly) that a reentry would not be attempted unless a determination had been made that the reentry vehicle would land within its designated landing site at a predetermined probability level. The FAA is planning to impose regulatory controls that minimize the probability of a random reentry

and would examine a range of failure and accident scenarios, including any major system failures that fall within the threshold probability of occurrence, that may cause a reentry to be uncontrolled or essentially random. Accordingly, the FAA believes that application of MPL methodology to reentry will result in insurance requirements that adequately account for maximum probable reentry risks.

With respect to government property considerations in determining MPL, the NPRM on Financial Responsibility for Licensed Launch Activities (61 FR 38992, Jul 25, 1996) provides an elaborate discussion regarding the nature and extent of property that must be covered by government property insurance for loss or damage. In essence, all property of the government, and its contractors and subcontractors who are involved in launch or reentry services for a particular launch or reentry, at a Federal range facility must be covered in the event of loss or damage. Government range property includes that which is located on an adjacent Federal range facility. Government property located off the Federal range facility is considered third party property because risks to such property are no greater than risk exposure of other unrelated off-site property. A licensee's liability policy is expected to respond to government claims for property loss or damage to property located off of a Federal range unless the property is involved in the licensed activity and has been specifically identified in a license as covered government property for purposes of government property insurance coverage.

Government property concerns may be less paramount for reentry than they are currently for launch because of potential use of non-Federal sites for reentry. Growing interest in RLV development has been matched by the number of non-Federal entities interested in offering authorized sites that could support RLV launch and recovery operations. The extent to which RLV developers would rely upon the safety services and

facilities of Federal ranges to support vehicle reentry and recovery is not yet known, nor is the willingness of Federal range facilities to allow unproven reentry vehicles to land on their property. To the extent government range or other test assets are identified as being at risk as a result of a licensed reentry, the FAA would require government property insurance. However, the agency envisions that reentry sites may be located on private or state-owned land and that there may be no government property insurance requirement associated with a particular reentry license.

MPL methodology would be used to establish third-party liability insurance requirements for licensed reentry activities. The assessment would not take into account injury, damage or loss to those nongovernment-related entities participating in licensed reentry activities (private party reentry participants or PPRPs), including employees of those entities. Nor would it take into account injury, damage or loss to nongovernment-related entities involved in the licensed launch (private party launch participants or PPLPs) that is associated with or preceded the reentry because, as indicated above, their participation in the launch makes them sufficiently involved in a subsequent reentry as to warrant insurance coverage for their resultant liability to third parties and their participation in the reciprocal waiver scheme. As a general matter, entities participating in licensed flight would either be within the scope of required financial responsibility coverage as involved parties or outside of it as third parties, for the duration of the mission. With RLV activities, in particular, it seems difficult and probably undesirable to attempt to sever or partition, for purposes of insurance and liability, the different entities from launch or reentry risks. However, consistent with 14 CFR Part 440, Government personnel, defined as employees of the United States and its contractors and subcontractors, involved in launch or reentry services for licensed activities, are in a

unique position inasmuch as they are additional insureds under the required liability insurance and are also potential claimants against the liability policy in the event they suffer personal injury, damage or loss.

Section 450.7(a), as proposed, provides that the MPL determination forms the basis of financial responsibility requirements imposed on a reentry licensee in a license order.

Consistent with 49 U.S.C. 70112(c), § 450.7(b) identifies the 90-day period in which the FAA is required to issue an MPL determination after all information required of the licensee is submitted to the FAA. As applied to launch licenses, the agency has experienced significant impediments to its ability to comply with the 90-day requirement because of the time required to obtain information from other Federal agencies and then to coordinate the results of the MPL analysis with those agencies. Factors beyond the FAA's control may affect timely issuance of an MPL determination; however, the agency will keep licensees or applicants informed of its progress and anticipated delays.

Section 450.7(c) directs applicants to Appendix A, where information requirements to support an MPL determination for licensed reentry activities are located. It also presents a procedural mechanism whereby a person requesting an MPL determination can certify the continuing accuracy and applicability of previously provided information instead of resubmitting data. Changes in data must be reported to the FAA to ensure the continuing validity of an MPL determination.

Prospective reentry licensees contemplate RLVs having rapid turn-around times. RLV developers have urged the agency not to impose regulatory obstacles, such as reissuance of MPL and insurance requirements between missions, to their goal of quick re-deployment. The FAA intends to work with prospective licensees to ensure their

concerns regarding regulatory impediments do not materialize. One solution may be to suggest to applicants that they propose multiple reentry sites in applications so that a change in future reentry plans does not necessitate an additional review period, either for safety or MPL determination purposes. Of course, this approach requires much more extensive data submissions on the part of an applicant and may also slow down the review process for the agency in that it would have additional safety and risk considerations to evaluate. The FAA also intends to continue use of its operator license concept once an applicant demonstrates its qualifications and doing so should also facilitate the planned frequency of launch and reentry services envisioned by the industry.

Section 450.7(d) provides that the FAA would amend its MPL determination before completion of licensed activity if new information so indicates. As with amendment of financial responsibility requirements in general, this provision is not intended to allow the agency to alter requirements mid-flight. Rather, it provides notice to licensees that requirements may be changed, raised or lowered, when the FAA determines it is appropriate to do so on the basis of additional information learned by the agency. Insurance requirements that accompany an operator license are intended to remain in force for the life of the license, proposed as a two-year renewable term in the RLV Licensing Regulations. Section 450.7(d) provides notice that such requirements may change during the life of the license to reflect changes in risk or values.

Persons other than prospective reentry licensees may request an MPL determination for their activity and the FAA would like to accommodate requests for advisory MPL determinations, as reflected in proposed § 450.7(e). For example, a reentry site operator may request a determination. An existing reentry licensee may be contemplating a change in operations or its designated reentry site but would be unwilling

to formalize its plans in a license amendment application until it knows whether those changes would significantly alter its insurance obligations and possibly its costs. Because priority would be given to actual license applications, no time limit is provided in which the agency must comply with a request for an MPL determination that is advisory in nature.

Section 450.9 – Insurance requirements for licensed reentry activities

Proposed § 450.9 sets forth the two types of insurance a licensee could be required to obtain as a condition of its reentry license. Government property insurance would be required if government range or test assets would be sufficiently exposed to risk of damage or loss as a result of reentry activities. As a general matter, liability insurance would always be required to provide coverage to participants in licensed reentry activities, including licensed launch activities associated with a reentry, in the event of their legal liability to third parties, including Government personnel, for injury, damage or loss. Claims of employees of participants other than the government and its involved contractors and subcontractors are the responsibility of their employer, as explained in greater detail under the discussion of proposed § 450.17, and are not considered in the determination by the FAA of the amount of liability insurance that must be available to cover third party claims.

Section 450.9(a) provides that compliance with insurance requirements or other demonstration of financial responsibility is a requirement of a reentry license.

As directed by 49 U.S.C. 70112(a)(4), additional insureds covered by insurance are identified in proposed § 450.9(b). For a licensed reentry, the FAA would also require that additional insureds include persons and entities involved in any launch that is

associated with a particular reentry because they, too, risk liability exposure as a result of their participation in licensed flight in the event of third-party loss or damage.

Proposed § 450.9(c) establishes that the amount of required liability insurance for covered third party claims is based upon the FAA's MPL determination. The amount of insurance that may be required is limited by statute to the lesser of $500 million or the maximum available on the world market at reasonable cost. The determination of reasonable cost is assigned by regulation to the FAA. Covered third party claims include claims of employees of the government and its contractors and subcontractors. Covered third party claims exclude claims of employees of other participants in a licensed reentry event or RLV mission (PPRPs), including employees of entities involved in a licensed launch (PPLPs) associated with a particular reentry. Loss or damage to government property and that of government contractors and subcontractors other than that for which government property insurance is required under § 450.9(d) would also be a covered claim under the liability insurance requirement. For example, a licensed reentry to the designated reentry site of Vandenberg Air Force Base would include, as a condition of the license, insurance covering loss or damage to government property located on Vandenberg Air Force Base. However, if the reentry vehicle misses the targeted landing point and impacts the U.S. Post Office in nearby Lompoc, California, the liability policy would be required to respond to the claim.

Requirements for government property insurance are proposed in § 450.9(d). It provides that claims by the United States, its agencies, and its contractors and subcontractors involved in licensed reentry activities, for property damage or loss at a Federal range facility that results from the licensed activity must be covered, absent willful misconduct by the government or its agents causing such damage or loss. Damage

caused by a government contractor or employee must be covered by the policy. A detailed explanation of the status of government contractors and subcontractors appears in the supplementary information accompanying the Part 440 Final Rule (63 FR 45592, Aug. 26, 1998) and the reader is referred to that document for further information. Government property at a Federal range facility includes property located at an adjacent Federal range facility. Cape Canaveral Air Station and Kennedy Space Center are an example of adjacent Federal range facilities.

Section 450.9(e) indicates that Government property insurance requirements are based upon MPL and are capped by statute at the lesser of $100 million or the maximum available on the world market. The regulation would leave the determination of reasonable cost to the agency.

The CSLA allows licensees to demonstrate financial responsibility in a manner other than insurance; however, the FAA's experience is that insurance is the unanimously preferred choice. Where a reentry licensee opts to use another method of demonstrating financial responsibility, the FAA would require a detailed explanation of its adequacy, as indicated in proposed § 450.9(f).

Section 450.11 – Duration of coverage; modifications

The required duration of insurance coverage must be sufficiently broad as to cover anomalous situations that result from planned reentries. Anomalous situations may include premature reentry, delayed reentry or reentry to a contingency abort location. Accordingly, to satisfy statutory objectives, the FAA believes that it is necessary and appropriate to require that insurance coverage be available to respond to reentry-related claims, including those that arise before intentional initiation of reentry or descent flight of a reentry vehicle.

Licensed reentry activities, and as a practical matter licensed launch activities associated with a reentry, may not commence without demonstration by the licensee of financial responsibility. Consistent with the scope of a reentry license, insurance must be in effect any time licensed reentry activity takes place, including the conduct of on-orbit reentry readiness procedures and system checks, and remain in place to cover claims resulting from an errant or aborted reentry.

Under part 440 requirements, for orbital launches, launch insurance must remain in effect until the later of 30 days following payload separation or ignition of the vehicle. 14 CFR 440.11(a). As a practical matter, therefore, to the extent a reentry anomaly is proximately caused by a licensed launch, insurance would exist under part 440 to cover its consequences. However, reentry anomalies may occur wholly independent of a launch, as previously illustrated in examples. A reentry anomaly could occur after a nominal launch and, absent a causal relationship to the launch, may not be covered by launch insurance unless reentry risks are also specifically included in the policy. Also, some reentry activities may be planned to take place long after a launch has been concluded, as was the case for the COMET/METEOR Program. In such cases, insurance must be available to respond to reentry-related claims that are wholly distinct from launch-related events.

The FAA proposes to require that reentry insurance remain in place for a period of 30 days following initiation of reentry flight, with a caveat. A reentry may be aborted, leaving a vehicle remaining on orbit where it could pose risk to other space objects or reenter at some future time. A reentry vehicle that remains on orbit as a result of an aborted reentry may enter Earth atmosphere due to forces of natural orbital decay and cause harm on the surface of the Earth. It is difficult to predict, as a general matter, when

such a "natural reentry" will occur, and in any event, it is possible that the vehicle would burn up when it enters Earth atmosphere due to atmospheric drag effects or risk mitigation measures imposed as a condition of a reentry license.

However, reentry vehicles would be designed to withstand the rigors of reentry, at least under nominal circumstances, and therefore the FAA does not equate the risks associated with random reentry of a reentry vehicle with those associated with an expendable launch vehicle upper stage that enters Earth atmosphere. In the latter case, it is probable that the vehicle stage would burn up, although an exceptional case may occur, such as the fuel tank of a Delta II vehicle that entered Earth atmosphere through orbital decay several years ago and landed substantially intact. Risks of intact reentry presented by a random reentry of a reentry vehicle would be assessed by the FAA as part of the risk assessment performed to determine whether a reentry mission may be licensed. As a result of that assessment, the FAA believes it would be able to determine the point in time at which reentry risks are sufficiently small such that financial responsibility requirements would no longer be necessary. Accordingly, the FAA proposes to assess duration of insurance requirements for abort to orbit situations through a risk-based assessment that indicates when demonstrable risk from a random reentry is no longer of sufficient consequence as to require insurance coverage. A similar approach is used under 14 CFR 440.11(a)(3) in establishing duration of insurance for suborbital launches. As is true for launch, indemnification would be available from the first dollar of loss when insurance is no longer required, assuming other eligibility requirements are satisfied. Therefore, unlike part 440 requirements for orbital launches, the agency is not proposing a finite duration of insurance measured from a planned event, whether or not that event occurs nominally or non-nominally.

The FAA believes that its proposed approach is particularly prudent and necessary to cover the government's liability under the Outer Space Treaties, particularly the Liability Convention. Under the Liability Convention, the Government remains strictly liable for damage on the ground caused by its space object when it is a launching state.

Under proposed § 450.11(b), the FAA continues its current practice of prohibiting changes in insurance coverage, including cancellation, without 30 days notice to the FAA and approval by the agency. The FAA understands that insurers retain certain rights of cancellation in their policies; however, insurance may not be cancelled once licensed activities have commenced until the required duration of insurance has expired. This requirement is particularly important where an on orbit abort occurs and insurance would be required to remain in effect for a significant length of time.

Comments are requested on the FAA's proposed approach to ensuring financial responsibility for foreseeable reentry risks.

Section 450.13 – Standard conditions of insurance coverage

The FAA is proposing that insurance policies satisfy the same terms and conditions for reentry as apply to insurance policies obtained in conformance with part 440 requirements. The interested public is referred to the NPRM on Financial Responsibility Requirements for Licensed Launch Activities and the Part 440 Final Rule for a detailed explanation of proposed terms. (See 61 FR at 39009-10 and 63 FR at 45614, respectively.)

Section 450.13(a)(2), as proposed, would continue the current practice of requiring that policy limits apply on a per occurrence basis.[10] This requirement has not been controversial nor has it presented difficulties in terms of industry ability to comply, to the agency's knowledge. As a practical matter, an accident that causes substantial liability or government property damage during preparatory operations at a launch site is probably one that also causes extensive damage to the launch vehicle, thereby terminating that particular launch. An accident that causes substantial liability or government property damage during flight of the vehicle is also one that terminates the launch. Accordingly, requiring coverage for the aggregate of claims on a per occurrence basis has not strained insurance capacity or raised concerns among underwriters.

At the October 1998 meeting of the Risk Management Working Group (RMWG) of the FAA's Commercial Space Transportation Advisory Committee or COMSTAC, one insurance broker noted that RLV missions present underwriting difficulties that do not exist in underwriting ELV risks. Unlike ELV missions, RLVs present opportunities for multiple occurrences during a single mission, even if one or more flight phases are accomplished successfully. For example, Kistler Aerospace Corporation utilizes a two-stage launch technology. The first stage separates and is intended to return to the launch site, while the second stage continues to orbit, enters Earth orbit, and approximately 24 hours later returns to a reentry site on Earth. A covered occurrence could take place as a result of return of the first stage to the launch site, anomalous payload deployment by the Kistler vehicle, and upon final reentry to the designated reentry site. Thus, a combination of occurrences could result in claims in excess of the aggregate limits of the policy,

[10] Financial responsibility requirements for licensed launch activities provide that insurance policy limits must apply separately to each occurrence, and that for each occurrence, policy limits must apply to the total

assuming a single policy covering launch and reentry is obtained for the entire mission. According to the broker, underwriters have expressed unwillingness to insure the uncapped liability which could result from requiring coverage on a per occurrence basis.

The FAA proposes to separate launch from reentry risk in prescribing financial responsibility for a single RLV mission. Doing so may have the added benefit of limiting the combination of occurrences that may take place during a particular flight phase and the amount of financial responsibility required to cover all such occurrences. MPL methodology would take into account the probability of multiple occurrences during a single flight phase and would reflect the aggregate value of losses that may result during each phase if multiple events are found to be sufficiently probable. Another possible approach to RLV mission financial responsibility may lead the FAA to aggregate its MPL determinations for each flight phase into an aggregate value that must be insured for the duration of an RLV mission, thereby capping liability limits of insurance, albeit at a potentially high level (although it cannot exceed $500 million or the amount available on the world market at reasonable rates for launch and for reentry). The FAA seeks public comment on possible solutions that would ensure adequate coverage is provided while not depleting insurance market capacity. In commenting on this issue, the public is reminded that under the statute, the RLV industry is expected to cover launch risk up to the maximum allowable MPL, as well as reentry risk up to the same amount. The FAA's proposed mission approach to licensing RLVs is not intended to increase financial risk to the government.

Consistent with part 440 requirements, proposed § 450.13(a)(5) would require that exclusions from coverage be specified in insurance certificates submitted to the FAA

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of claims arising out of the licensed activity in connection with any particular launch. 14 CFR 440.13(a)(2).

as evidence of compliance with financial responsibility. Claims resulting from excluded risks that are "usual" are eligible for indemnification under the terms of 49 U.S.C. 70113 from the first dollar of loss, under procedures set forth in proposed § 450.19. Accordingly, the FAA requests information, in advance of the first licensed reentry, concerning the kinds of risks for which insurance is not commercially available at reasonable rates. A complete discussion of "usual" exclusions and the FAA's approach to addressing such exclusions is found in the Part 440 Final Rule at 63 FR 45617.

Section 450.13(a)(8) appears different from its companion requirement for licensed launch activities, 14 CFR 440.13(a)(8). It addresses certain qualifications of insurers under these requirements.

Following issuance of final rules governing financial responsibility for licensed launch activities, the agency learned that a great many insurers involved in insuring aviation and aerospace risks are not licensed to do business in any State, territory, possession of the United States, or the District of Columbia, as stipulated in § 440.13(a)(8). The reason for this requirement is to assure that additional insureds under a policy can enforce legal rights against the insurer within the United States. It is not intended as a protectionist device to restrict or impede access to overseas insurance markets. The FAA has issued an Advisory Circular, AC No. 440-01, indicating that a licensee is in compliance with § 440.13(a)(8) as long as each policy of insurance contains a service of suit clause in which the insurer agrees to submit to the jurisdiction of a court of competent jurisdiction within the United States and designates an authorized agent within the United States for service of legal process on the insurer. The FAA understands that given the terms of the Advisory Circular licensees are able to comply without difficulty with the terms of § 440.13(a)(8). Accordingly, the FAA will accept as

compliant with § 450.13(a)(8) insurance policies that contain a service of suit clause and designation of agent provision and this is expressly set forth in the proposed requirement in lieu of an advisory circular.

Section 450.15 – Demonstration of compliance

Under proposed § 450.15, a reentry licensee would be required to demonstrate compliance with part 450 financial responsibility and allocation of risk requirements in a manner comparable to that currently required of launch licensees under part 440.

Reentry proposals presented to the FAA as part of pre-application consultations include RLVs designed to reenter after a brief stay on orbit. Accordingly, evidence of reentry insurance must be submitted to and reviewed by the FAA in advance of the licensed launch that will place the vehicle in space. For this reason, the FAA proposes to require satisfaction of financial responsibility requirements under part 450 at the same time financial responsibility for launch is demonstrated. Timeframes for submission of proof of insurance and the required reciprocal waiver of claims and assumption of responsibility agreement under § 450.15 would therefore be the same as for licensed launches and would consist of the same elements. These include a licensee's certification of compliance with applicable license orders, filing of insurance certificates or other evidence of financial responsibility, certification that exclusions from coverage are usual and that insurance covering the excluded risks is not commercially available at reasonable rates, submission of the reciprocal waiver of claims agreement in accordance with § 450.17, and an opinion of the licensee's insurance broker that insurance obtained on behalf of the licensee complies with applicable requirements.

Section 450.17 – Reciprocal waiver of claims requirements and appendix B

The Commercial Space Act of 1998 extends to reentry licensees and participants in reentry activities requirements for entering into reciprocal waivers of claims comparable to those imposed on launch licensees and participants in launch activities. The scope of required waivers for licensed launch activities and the responsibilities assumed by each signatory to a reciprocal waiver agreement are explained at length in the Part 440 Final Rule (63 FR 45592, Aug. 26, 1998) and the FAA's detailed rationale need not be repeated in this document.

In summary, each participant in licensed launch or reentry activities is directed to enter into a mutual or reciprocal waiver of claims whereby each party agrees to waive claims it may have against the other participants for property damage or loss it may sustain and agrees to be responsible for property damage or loss it sustains as a result of licensed activities. Each participant is therefore foreclosed, or estopped, from asserting claims for property damage or loss against the other participants, and each is relieved of the threat and cost of inter-party litigation. When the government is involved in licensed activities, however, its waiver of claims is limited to amounts in excess of insurance required to cover claims for damage or loss to government property. Each participant in licensed activities further agrees to be responsible for personal injury, property damage or loss sustained by its own employees as a result of licensed activities. The final rules issued by the FAA under part 440 clarify that, except for U.S. Government participants including government contractors and subcontractors, the obligation of each participant in licensed activities to assume responsibility for such losses is a contractual obligation to indemnify and hold harmless the other participants in the event of losses sustained by one's own employee. The reciprocal waiver of claims agreement presented in 14 CFR

Part 440, Appendix B, reflects this contractual undertaking. Therefore, claims of employees of the various participants in licensed activities, other than those of Government personnel as defined in the regulations fall outside the scope of liability insurance coverage required under the statute and are not eligible for indemnification as third party claims. Government personnel are treated differently, as explained in the part 440 rulemaking, because of limitations on the Government's ability to accept an unfunded contingent liability, and therefore claims of Government personnel are handled as third party claims to which a licensee's liability policy must respond.

The FAA will require a reciprocal waiver of claims agreement resembling that presented in 14 CFR Part 440, Appendix B, which attempts to fashion a single agreement covering all participants in related launch and reentry operations. Although the proposed part focuses upon licensed reentry activities, the FAA anticipates that most licensed reentry activity will involve reentry vehicles that are RLVs and has attempted to design a reciprocal waiver of claims agreement that accommodates both RLVs and other reentries. Participants in a licensed reentry may suffer damage or loss and their employees may suffer losses through their involvement in the licensed launch campaign required to place a reentry vehicle or payload in Earth orbit or outer space and all such participants would be included in the reciprocal waiver scheme to accomplish its intended objective of limiting the risk of inter-party litigation. Where a licensed reentry is intended to occur sufficiently independently of the launch that placed the reentry vehicle in space, it may be possible to separate launch participants from reentry participants, and the FAA would address those situations on a case-by-case basis. For the near-term, the agency is proposing to utilize a form of agreement that encompasses both launch and reentry participants. The form of agreement proposed in part 450 reflects the agency's approach

by referring to “licensed activities” and incorporating the broad definitions of “customer” and “contractors and subcontractors” provided in the proposed regulations. Where the identity of the customer for a licensed reentry is different from that for a launch of an RLV associated with the conduct of a reentry, both customers must sign the reciprocal waiver of claims agreement.

The reciprocal waiver of claims agreement is intended to be broadly construed and cover claims regardless of fault, but does not replace contractual rights and remedies negotiated by the parties in good faith and for consideration, such as reflight guarantees or replacement missions. In the Part 440 Final Rule, the FAA indicated that only claims resulting from willful misconduct are necessarily removed from the reciprocal waiver and declined to remove gross negligence from the statutory waiver scheme as a matter of regulation. Since issuance of the Part 440 Final Rule, however, the FAA has learned of reluctance among contractors, subcontractors and customers to include a waiver of gross negligence leaving participants in licensed launches to negotiate coverage for gross negligence-based claims to resolve any remaining ambiguity and to avoid litigation. Rather than facilitate the prospect of future litigation, the FAA now intends to foreclose that possibility by continuing to employ a no-fault, no subrogation waiver of claims agreement comparable to that utilized for licensed launches. In doing so, the agency affirmatively states that claims for gross negligence are intended to be comprehended by the reciprocal waiver of claims agreement in order to fulfill its statutory intent and purpose. The only exception is willful misconduct by a participant. The FAA believes that with the sole exception of willful misconduct, all fault-based claims, including gross negligence, must be waived in order to satisfactorily fulfill the intent of Congress in

legislating a comprehensive reciprocal waiver scheme and foreclose erosion of its effectiveness through allegations of gross negligence.

A second concern has also come to the FAA's attention since issuance of the Part 440 Final Rule. As a matter of convenience and to relieve regulatory burdens, the FAA implements statutory reciprocal waiver requirements by executing an agreement with the licensee and its customer and requiring that each of them pass on, or flow down, to their contractors and subcontractors responsibilities that must be accepted under the terms of the agreement. The FAA has learned that customers and contractors of launch participants have been reluctant to comply with flow down requirements of the reciprocal waiver of claims agreement. Although the form of agreement utilized by the FAA provides relief, through an indemnification provision, to a participant that suffers liability as a result of the failure of a signatory to implement the agreement properly, the FAA reminds participants that such relief measures are not intended to be used as an option in lieu of compliance with agreement requirements. Participants in licensed launch and reentry activities are directed by 49 U.S.C. 70112(b) to enter into such an agreement with the government and with each other. The FAA has qualified the requirement by noting that "[o]nly those participants who have their personnel or property involved in licensed launch [or reentry] activities, and who may make claims against other participants as a result of loss or damage sustained by their personnel or [to their] property in the event of an accident, should be expected to enter into reciprocal waivers of claims." 61 FR at 39012. For such entities, participation is not intended to be elective. Failure to comply may subject a participant in licensed launch or reentry activities to enforcement proceedings by the FAA.

Section 450.19 – United States payment of excess third-party liability claims

Proposed § 450.19 would set forth in a regulation the commitment of the U.S. Government and the procedures by which it accepts responsibility for satisfying successful third party claims against reentry and associated launch participants to the extent claims are covered claims and exceed required insurance up to $1.5 billion (as adjusted for post-January 1, 1989 inflation) above that amount, absent willful misconduct by the party on whose behalf payment of the third-party claim is sought.

Following expiration of the policy period required under the regulations, or if coverage is not available because of a "usual" exclusion, the Government undertakes responsibility for third-party claims from the first dollar of loss, as long as the claim is eligible for indemnification. According to House Science Committee report language, a clear causal nexus must exist between the licensed activity and the claim to give rise to the government's obligations. Absent this causal nexus, the legally liable party would be fully responsible for satisfying claims and, in the event of Government liability under a treaty obligation, the Government could pursue contribution from the responsible party. As previously noted, the interested public may refer to the Part 440 Final Rule (63 FR 45592, Aug. 26, 1998) for a discussion of the FAA's approach to "usual" exclusions.

**Paperwork Reduction Act**

This proposal contains information collection requirements. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. section 3507(d)), the Department of Transportation has submitted the information collection requirements associated with this proposal to the Office of Management and Budget for its review.

Title: Financial Requirements for Licensed Reentry Activities

The FAA is proposing to establish financial responsibility requirements covering risks associated with the licensed reentry of a reentry vehicle. The FAA would determine, on an individual basis, the amount of required insurance or other form of financial responsibility after examining the risks associated with a particular reentry vehicle, its operational capabilities and designated reentry site. This proposal provides general rules for demonstrating compliance with insurance requirements and implementing statutory-based Government/industry risk sharing provisions in a manner comparable to that currently utilized for commercial launches.

The required information will aid the FAA in establishing financial responsibility requirements covering risks associated with the licensed reentry of a reentry vehicle. The information to be collected supports FAA determining the amount of required liability insurance for a reentry operator after examining the risks associated with an reentry vehicle, its operational capabilities, and its designated reentry site. Data collected for the reentry case closely parallel information associated with financial responsibilities for licensed launch activities. The frequency of required submissions, therefore, will depend upon the number of prospective reentry vehicle operators authorized to conduct licensed reentry operations.

The Respondents are all licensees authorized to conduct licensed reentry activities. ESTIMATED AVERAGE ANNUAL BURDEN 1566.

The agency is soliciting comments to (1) evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (2) evaluate the accuracy of the agency's estimate of the burden; (3) enhance the quality, utility, and clarity of the information to be collected; and (4) minimize the burden of the collection of information

on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology (for example, permitting electronic submission of responses).

Individuals and organizations may submit comments on the information collection requirements by [insert date 60 days after publication in the Federal Register], and should direct them to the address listed in the **ADDRESSES** section of this document.

According to the regulations implementing the Paperwork Reduction Act of 1995, (5 CFR Part 1320.8(b)(2)(vi)), an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control number for this information collection will be published in the Federal Register after it is approved by the Office of Management and Budget.

**Regulatory Evaluation Summary**

Proposed and final rule changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980, as amended in May 1996, requires agencies to analyze the economic effect of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade.

In conducting these analyses, the FAA has determined that the proposed rule would generate benefits that justify its costs and is "a non-significant regulatory action" as defined in the Executive Order and the Department of Transportation Regulatory Policies and Procedures. The proposed rule is not a significant action because of public interest

nor on the basis of economic impacts. The proposed rule is not expected to have a significant impact on a substantial number of small entities and would not constitute a barrier to international trade. In addition, this proposed rule does not contain Federal intergovernmental or private sector mandates. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply. These analyses, available in the docket, are summarized below.

Baseline for Analysis

For the purpose of this evaluation, the baseline is defined as industry practice that existed prior to the Commercial Space Act of October 1998 (CSA). The CSA authorizes the Secretary of the U.S. Department of Transportation to require reentry licensees to meet financial responsibility requirements, generally satisfied by acquiring liability insurance to cover those risks imposed by their intended reentry activities. Such requirements would be implemented in the form of this proposed rule. The baseline should represent routine industry practice in the absence of any proposed rulemaking requirements by FAA and prior to statutory authority received from Congress.

Costs

Reentry commercial space operators are likely to also be launch activity operators, given that RLVs will, for the foreseeable future, constitute the bulk of reentry vehicle activity. Since reentry operators would repeat much of the compliance process for the recently released final rule for launch financial responsibility, cost-saving knowledge will be gained that would be helpful in meeting similar proposed requirements for reentry financial responsibility. Even though reentry activities take place at different times than launch activities, still the personnel involved in both activities are expected to have acquired a high level of proficiency and cost-saving practices. The potential cost of the

proposed reentry financial responsibility requirements are expected to be lower than they otherwise would be, as the result of knowledge gained from launch activities by such operators.

The proposed rule should result in a stronger, more stable, commercial space transportation industry by formalizing the statute from the CSA into regulation. Limiting risk based on maximum probable loss (MPL) should result in greater certainty of the potential liability costs (and resulting lower business risk) to commercial space transportation firms. The Federal Aviation Administration defines MPL as the tool that establishes the dollar value of the maximum magnitude of loss among probable accidental events causing casualties or property damage; the accidental event in question must be sufficiently probable to warrant financial responsibility protection.

The proposed rule would potentially impose costs on U.S. commercial space reentry operators and the U.S. government as the result of these two requirements.

- Insurance Requirements for Licensed Reentry Activities**.** In accordance with the Statute, the proposed rule would require U.S. licensed reentry commercial space operators to acquire insurance to cover possible damage or loss of Government property. The licensee would also be required to obtain insurance to cover possible liability to participants in reentry activities in the event of death, injury, damage or loss to third parties (including Government personnel). These requirements also include the duration of insurance.

- Provisions Requiring Private Party Participants In Licensed Activities to Waive Claims Against One Another. The proposed rule would require that potentially impacted operators enter into cross-waiver agreements with each other. Specifically, the private parties in licensed activities sign waivers by which the parties agree to forfeit the right to sue each other for damages or injuries associated with the activities. The licensee not only assumes responsibility for its own losses, but now also assumes responsibility for claims of its contractors and subcontractors against other private party participants in the event the cross-waiver requirement has not been properly applied to those parties.

The proposed 30-day duration of insurance coverage following a planned reentry may impose additional costs on reentry operators. Such costs are not expected to be significant since potential 30-day costs for reentry would be nearly the same as an existing requirement for launch activity, and reentry insurance coverage falls within the typical period of coverage routinely used by the commercial space industry. The shifting of expected costs above MPL of damage and loss claims or of injury claims from the licensees to the Government would also aid the commercial space transportation industry. The shifting of these costs onto the Government would relieve the licensees of the need to insure for these claims and would also demonstrate U.S. government support for the commercial space transportation industry. The cross-waiver provisions of the proposed rule should lower any costs of litigation among private party participants in licensed activities. The proposed requirement for cross-waivers limits the risk of liability to others in licensed activities and results in a more certain business environment (or lower business risk) for all involved parties.

The FAA estimates that the proposed rule would result in the reallocation of expected liability insurance costs from licensees to the Federal government of about $4,200 ($3,700, discounted) over a five-year period. This estimate is based in part upon work by Princeton Synergetics Inc. (PSI), under contract with the FAA, which analyzed the consequences of the U.S. government's assumption of risk exposure of up to $1.5 billion (subject to adjustment for inflation after January 1, 1989) for third-party claims. The additional administrative (or paperwork cost) to the Federal government associated with FAA's responsibilities under the proposed rule is estimated at $7,600 ($5,800, discounted) over five years. Thus, the total cost to the FAA would be about $11,800 ($4,200 + $7,600) over the next 5 years, as the result of the proposed rule. This cost

estimate represents the amount that would be incurred by the FAA for financial responsibility aspects of the licensing process (which take into account those proposed provisions to protect private party participants against claims by third parties and provisions of cross-waivers).

Benefits

The primary benefit of the proposed rule is that it would support and promote U.S. commercial space reentry activity within the United States and by U.S. firms. It is clearly in the interest of the United States to remain in a worldwide position of leadership in commercial space flight. Specifically, the proposed rule would ensure that the United States reentry operators are not subject to a competitive trade disadvantage by their rivals abroad as a result of their inability to acquire adequate liability insurance to cover risks associated with their intended reentry activities.

This proposed rule would also generate other potential qualitative benefits in two forms. First, in terms of third parties, this proposed rule would provide added assurance that any damages to property or casualty losses (e.g., fatalities or serious injuries) resulting from reentry activities would be adequately covered either by commercial liability insurance purchased by reentry operators or by the U.S. government. This potential benefit would be generated by the proposed requirement that all reentry operators have liability insurance coverage up to the MPL amount for risks resulting from their intended reentry activities and statutory risk sharing provisions whereby the U.S. government provides indemnification up to $1.5 billion (subject to adjustment for inflation after January 1, 1989) above the required insurance by this proposal. And last, the proposed cross-waiver requirement would also generate potential cost-savings by likely mitigating or eliminating litigation costs between reentry participants.

**Initial Regulatory Flexibility Determination**

The Regulatory Flexibility Act of 1980 establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the proposed rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis (RFA) as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The Small Business Administration has defined small business entities relating to space vehicles (Standard Industrial Codes 3761, 3764, and 3769) as entities comprising fewer than 1,000 employees. The FAA has been unable to determine the extent to which the proposed rule would impact the five commercial space reentry entities currently developing reentry technology, due to the lack of information for the required cost of insurance, as explained previously in the cost section of this evaluation. The proposed

rule could impose additional costs on potential small reentry operators in the form of higher insurance requirements (which often result in higher premiums), as the result of the proposed requirement to cover MPL for both third party liability and Government property. On the other hand, the proposed requirement could be partially offset or entirely offset by the potential cost-savings from the federal Government's statutory risk sharing indemnification feature of the proposed rule. This feature would shift the cost of insurance coverage from the licensee for any liability beyond MPL after 30 days, up to $1.5 billion (subject to adjustment for inflation after January 1, 1989). This cost-savings is estimated to be at least $4,200 for all of the potentially affected operators over the 5-year period (2000 – 2004). Still, with some degree of uncertainty, this information would suggest that the potential cost of compliance for reentry small operators might not be significant.

Despite the absence of quantitative cost information for potential reentry licensees and pursuant to the Regulatory Flexibility Act [5 U.S.C. 605(b)], the FAA certifies with reasonable certainty that the proposed rule would not impose a significant economic impact on a substantial number of small entities. While there maybe significant costs incurred by some operators, such costs are not expected to impact a substantial number of them. Since there is no cost of compliance information available to derive a quantitative cost estimate, there is still uncertanity about compliance costs. Because of this uncertainty, the FAA solicits comments from the commercial space reentry operators as to the net cost of compliance with the proposed rule. The FAA also solicits comments from affected entities with respect to this finding and determination. All comments must be clear and well documented.

**International Trade Impact Assessment**

The proposed rule contains revisions to commercial space transportation licensing regulations that would not constitute a barrier to international trade, including the export of domestic goods and services out of the United States. As noted in the benefits section of this evaluation, the proposed rule would implement statutory provisions such as measures aimed at strengthening the competitive position of U.S. reentry operators by allowing the U.S. government to share risks of additional liability insurance for reentry activity. This practice is done in other countries around the world for launch operators who compete with U.S. launch operators. The proposed rule would ensure that U.S. reentry operators would remain competitive with their counterparts abroad. For this reason**,** the proposed rule is not expected to place domestic commercial space reentry operators at a competitive trade disadvantage with respect to foreign interests competing for similar business in international markets. It would also not hinder the ability of foreign commercial space rivals to compete in the United States. Therefore, the proposed rule is neither expected to affect trade opportunities of U.S. commercial space reentry doing business abroad nor would it adversely impact the trade opportunities of foreign firms doing business in the United States. The FAA invites comments on the validity of this assertion and any potential impacts related thereto.

**Federalism Implications**

The regulations proposed herein will not have a substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposal

would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

**Unfunded Mandates Reform Act**

Title II of the Unfunded Mandates Reform Act of 1995, enacted as Public Law 104–4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate upon State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. In 1998 dollars, this estimate of $100 million translates into $105 million using the GDP implicit price deflators for 1995 and 1998. Section 204(a) of the Act, Title 2 of the United States Code 1534(a), requires the Federal agency to develop an effectiveness process to permit timely input by elected officers ( or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A significant intergovernmental mandate under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, Title 2 of the United States Code 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity for any affected small governments to provide input in the development of proposed rules.

Based on the evaluation and impacts reported herein, the proposed rule is not expected to meet the $105 million per year cost threshold. Consequently, it would not

impose a significant cost on or uniquely affect small governments. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply to the proposed regulation.

**Environmental Assessment**

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment (EA) or environmental impact statement (EIS). In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(i), regulatory documents which cover administrative or procedural requirements qualify for a categorical exclusion.

**Energy Impact**

The energy impact of the rulemaking action has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) and Public Law 94-163, as amended (42 U.S.C. 6362). It has been determined that it is not a major regulatory action under the provisions of the EPCA.

**List of Subjects in 14 CFR Part 450**

Armed forces; Claims; Federal building and facilities; Government property; Indemnity payments; Insurance; Reporting and recordkeeping requirements; Rockets; Space transportation and exploration.

**Proposed Amendments**

In consideration of the foregoing, the Federal Aviation Administration proposes to amend Chapter III of title 14 of the Code of Federal Regulations in one of the following two ways:

1. Subchapter C of Chapter III, Title 14, Code of Federal Regulations, would be amended by revising Part 440 to include the Financial Responsibility Requirements for Licensed Reentry Activities: or

2. Subchapter C of Chapter III, Title 14, Code of Federal Regulations, would be amended by adding a new Part 450 to read as follows:

**PART 450 -- FINANCIAL RESPONSIBILITY**

Subpart A -- Financial Responsibility for Licensed Reentry Activities

Sec.



**Authority**: 49 U.S.C. 70101-70121; 49 CFR 1.47.

**Subpart A Financial Responsibility for Licensed Reentry Activities**

**§ 450.1 Scope of part; basis.**

This part sets forth financial responsibility and allocation of risk requirements applicable to commercial space reentry activities that are authorized to be conducted under a license issued pursuant to this subchapter.

**§ 450.3 Definitions.**

(a) For purposes of this part --

Bodily injury means physical injury, sickness, disease, disability, shock, mental anguish, or mental injury sustained by any person, including death.

Contractors and subcontractors means those entities that are involved at any tier, directly or indirectly, in licensed reentry activities, and includes suppliers of property and services, and the component manufacturers of a reentry vehicle or payload. Contractors and subcontractors include those entities as defined in § 440.3(a)(2) of this chapter involved in licensed launch activities associated with a particular reentry.

Customer means

(1) A person who procures reentry services from a licensee or launch services associated with a particular reentry;

(2) Any person to whom the customer has sold, leased, assigned, or otherwise transferred its rights in the payload (or any part thereof), to be reentered by the licensee, including a conditional sale, lease, assignment, or transfer of rights.

(3) Any person who has placed property on board the payload for reentry or payload services; and

Any person to whom the customer has transferred its rights to such services.

Federal range facility means a Government-owned installation at which launches or reentries take place.

Financial responsibility means statutorily required financial ability to satisfy liability as required under 49 U.S.C. 70101-70121.

Government personnel means employees of the United States, its agencies, and its contractors and subcontractors, involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry. Employees of the United States include members of the Armed Forces of the United States.

Hazardous operations means activities, processes, and procedures that, because of the nature of the equipment, facilities, personnel, or environment involved or function being performed, may result in bodily injury or property damage.

Liability means a legal obligation to pay claims for bodily injury or property damage resulting from licensed reentry activities.

License means an authorization to conduct licensed reentry activities, issued by the Office under this subchapter.

Licensed reentry activities means the reentry of a reentry vehicle, including a reusable launch vehicle (RLV), as defined in a regulation or license issued by the Office and carried out pursuant to a license.

Maximum probable loss (MPL) means the greatest dollar amount of loss for bodily injury or property damage that is reasonably expected to result from licensed reentry activities;

(1) Losses to third parties, excluding Government personnel and other launch or reentry participants' employees involved in licensed reentry activities, that are reasonably

expected to result from licensed reentry activities are those having a probability of occurrence on the order of no less than one in ten million.

(2) Losses to Government property and Government personnel, as defined in this section, that are reasonably expected to result from licensed reentry activities are those having a probability of occurrence on the order of no less than one in one hundred thousand.

Office means the Associate Administrator for Commercial Space Transportation of the Federal Aviation Administration, U. S. Department of Transportation.

Property damage means partial or total destruction, impairment, or loss of tangible property, real or personal.

Regulations means the Commercial Space Transportation Licensing Regulations, codified at 14 CFR Ch. III.

Third party means:

(1) Any person other than:

(i) The United States, its agencies, and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry;

(ii) The licensee and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry; and

(iii) The customer and its contractors and subcontractors involved in reentry services for licensed reentry activities or launch services for licensed launch activities associated with a particular reentry.

(2) Government personnel, as defined in this section, are third parties.

United States means the United States Government, including its agencies.

(b) Except as otherwise provided in this section, any term used in this part and defined in 49 U.S.C. 70101-70121 or in § 401.5 of this chapter shall have the meaning contained therein.

**§ 450.5 General**.

(a) No person shall commence or conduct reentry activities that require a license unless that person has obtained a license and fully demonstrated compliance with the financial responsibility and allocation of risk requirements set forth in this part.

(b) The Office shall prescribe the amount of financial responsibility a licensee is required to obtain and any additions to or modifications of the amount in a license order issued concurrent with or subsequent to the issuance of a license.

(c) Demonstration of financial responsibility under this part shall not relieve the licensee of ultimate responsibility for liability, loss, or damage sustained by the United States resulting from licensed reentry activities, except to the extent that:

(1) Liability, loss, or damage sustained by the United States results from willful misconduct of the United States or its agents;

(2) Covered claims of third parties for bodily injury or property damage arising out of any particular reentry exceed the amount of financial responsibility required under § 450.9(c) of this part and do not exceed $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) above such amount, and are payable pursuant to 49 U.S.C. 70113 and § 450.19 of this part. Claims of employees of entities listed in § 450.3(a) and in the definition of third party in paragraph 1 (ii)(iii) of this part for bodily injury or property damage are not covered claims;

(3) Covered claims for property loss or damage exceed the amount of financial responsibility required under § 450.9(e) of this part and do not result from willful misconduct of the licensee; or

(4) The licensee has no liability for covered claims by third parties for bodily injury or property damage arising out of any particular reentry that exceed $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) above the amount of financial responsibility required under § 450.9(c) of this part.

(d) A licensee's failure to comply with the requirements in this part may result in suspension or revocation of a license, and subjects the licensee to civil penalties as provided in part 405 of this chapter.

**§ 450.7 Determination of maximum probable loss**.

(a) The Office shall determine the maximum probable loss (MPL) from covered claims by a third party for bodily injury or property damage, and the United States, its agencies, and its contractors and subcontractors for covered property damage or loss, resulting from licensed reentry activities. The maximum probable loss determination forms the basis for financial responsibility requirements issued in a license order.

(b) The Office issues its determination of maximum probable loss no later than ninety days after a licensee or transferee has requested a determination and submitted all information required by the Office to make the determination. The Office shall consult with Federal agencies that are involved in, or whose personnel or property are exposed to risk of damage or loss as a result of, licensed reentry activities before issuing a license order prescribing financial responsibility requirements and shall notify the licensee or transferee if interagency consultation may delay issuance of the MPL determination.

(c) Information requirements for obtaining a maximum probable loss

determination are set forth in Appendix A to this part. Any person requesting a determination of maximum probable loss must submit information in accordance with Appendix A requirements, unless the Office has waived requirements. In lieu of submitting required information, a person requesting a maximum probable loss determination may designate and certify certain information previously submitted for a prior determination as complete, valid, and equally applicable to its current request. The requester is responsible for the continuing accuracy and completeness of information submitted under this part and shall promptly report any changes in writing.

(d) The Office shall amend a determination of maximum probable loss required under this section at any time prior to completion of licensed reentry activities as warranted by supplementary information provided to or obtained by the Office after the MPL determination is issued. Any change in financial responsibility requirements as a result of an amended MPL determination shall be set forth in a license order.

(e) The Office may make a determination of maximum probable loss at any time other than as set forth in paragraph (b) of this section, upon request by any person.

**§ 450.9 Insurance requirements for licensed reentry activities**.

(a) As a condition of each reentry license, the licensee must comply with insurance requirements set forth in this section and in a license order issued by the Office, or otherwise demonstrate the required amount of financial responsibility.

(b) The licensee must obtain and maintain in effect a policy or policies of liability insurance, in an amount determined by the Office under paragraph (c) of this section, that protects the following persons as additional insureds to the extent of their respective potential liabilities against covered claims by a third party for bodily injury or property damage resulting from licensed reentry activities:

(1) The licensee, its customer, and their respective contractors and subcontractors, and the employees of each, involved in licensed reentry activities and in licensed launch activities associated with a particular reentry;

(2) The United States, its agencies, and its contractors and subcontractors involved in licensed reentry activities and in licensed launch activities associated with a particular reentry; and

(3) Government personnel.

(c) The Office shall prescribe for each licensee the amount of insurance required to compensate the total of covered third-party claims for bodily injury or property damage resulting from licensed reentry activities. Covered third-party claims include claims by the United States, its agencies, and its contractors and subcontractors for damage or loss to property other than property for which insurance is required under paragraph (d) of this section. The amount of insurance required is based upon the Office's determination of maximum probable loss; however, it will not exceed the lesser of:

(1) $500 million; or

(2) The maximum liability insurance available on the world market at a reasonable cost, as determined by the Office.

(d) The licensee must obtain and maintain in effect a policy or policies of insurance, in an amount determined by the Office under paragraph (e) of this section, that covers claims by the United States, its agencies, and its contractors and subcontractors involved in licensed reentry activities resulting from licensed reentry activities. Property covered by this insurance must include all property owned, leased, or occupied by, or within the care, custody, or control of, the United States and its agencies, and its contractors and subcontractors involved in licensed reentry activities, at a Federal range

facility. Insurance must protect the United States and its agencies, and its contractors and subcontractors involved in licensed reentry activities.

(e) The Office shall prescribe for each licensee the amount of insurance required to compensate claims for property damage under paragraph (d) of this section resulting from licensed reentry activities in connection with any particular reentry. The amount of insurance is based upon a determination of maximum probable loss; however, it will not exceed the lesser of:

(1) $100 million; or

(2) The maximum available on the world market at a reasonable cost, as determined by the Office.

(f) In lieu of a policy of insurance, a licensee may demonstrate financial responsibility in another manner meeting the terms and conditions applicable to insurance as set forth in this part. The licensee must describe in detail the method proposed for demonstrating financial responsibility and how it assures that the licensee is able to cover claims as required under this part.

**§ 450.11 Duration of coverage; modifications**.

(a) Insurance coverage required under § 450.9, or other form of financial responsibility, shall attach upon commencement of licensed reentry activities, and remain in full force and effect as follows:

(1) For ground operations, until completion of licensed reentry activities at the reentry site; and

(2) For reentry activities, thirty days from initiation of reentry flight; however, in the event of an abort that results in the reentry vehicle remaining on orbit, insurance shall remain in place until the Office's determination that risk to third parties and Government

property as a result of licensed reentry activities is sufficiently small that financial responsibility is no longer necessary, as determined by the Office through the risk analysis conducted to determine MPL and specified in a license order.

(b) Financial responsibility required under this part may not be replaced, canceled, changed, withdrawn, or in any way modified to reduce the limits of liability or the extent of coverage, nor expire by its own terms, prior to the time specified in a license order, unless the Office is notified at least 30 days in advance and expressly approves the modification.

**§ 450.13 Standard conditions of insurance coverage**.

(a) Insurance obtained under § 450.9 shall comply with the following terms and conditions of coverage:

(1) Bankruptcy or insolvency of an insured, including any additional insured, shall not relieve the insurer of any of its obligations under any policy.

(2) Policy limits shall apply separately to each occurrence and, for each occurrence to the total of claims arising out of licensed reentry activities in connection with any particular reentry.

(3) Except as provided in this paragraph herein, each policy must pay claims from the first dollar of loss, without regard to any deductible, to the limits of the policy. A licensee may obtain a policy containing a deductible amount if the amount of the deductible is placed in an escrow account or otherwise demonstrated to be unobligated, unencumbered funds of the licensee, available to compensate claims at any time claims may arise.

(4) Each policy shall not be invalidated by any action or inaction of the licensee or any additional insured, including nonpayment by the licensee of the policy premium,

and must insure the licensee and each additional insured regardless of any breach or violation of any warranties, declarations, or conditions contained in the policies by the licensee or any additional insured (other than a breach or violation by the licensee or an additional insured, and then only as against that licensee or additional insured).

(5) Exclusions from coverage must be specified.

(6) Insurance shall be primary without right of contribution from any other insurance that is carried by the licensee or any additional insured.

(7) Each policy must expressly provide that all of its provisions, except the policy limits, operate in the same manner as if there were a separate policy with and covering the licensee and each additional insured.

(8) Each policy must be placed with an insurer of recognized reputation and responsibility that is licensed to do business in any State, territory, possession of the United States, or the District of Columbia. A licensee complies with this section if each of its policies of insurance obtained under this part contains a contract clause in which the insurer agrees to submit to the jurisdiction of a court of competent jurisdiction within the United States and designates an authorized agent within the United States for service of legal process on the insurer.

(9) Except as to claims resulting from the willful misconduct of the United States or its agents, the insurer shall waive any and all rights of subrogation against each of the parties protected by required insurance.

(b) [Reserved.]

**§ 450.15 Demonstration of compliance**.

(a) A licensee must submit evidence of financial responsibility and compliance with allocation of risk requirements under this part, as follows, unless a license order

specifies otherwise due to the proximity of the licensee's intended date for commencement of licensed activities:

(1) The waiver of claims agreement required under § 450.17(c) of this part must be submitted at least 30 days before commencement of licensed launch activities involving the reentry licensee;

(2) Evidence of insurance must be submitted at least 30 days before commencement of licensed launch activities involving the reentry licensee;

(3) Evidence of financial responsibility in a form other than insurance, as provided under § 450.9(f) of this part, must be submitted at least 60 days before commencement of licensed launch activities involving the reentry licensee; and

(4) Evidence of renewal of insurance or other form of financial responsibility must be submitted at least 30 days in advance of its expiration date.

(b) Upon a complete demonstration of compliance with financial responsibility and allocation of risk requirements under this part, the requirements shall preempt any provisions in agreements between the licensee and an agency of the United States governing access to or use of United States reentry property or reentry services for licensed reentry activities which address financial responsibility, allocation of risk and related matters covered by 49 U.S.C. 70112, 70113.

(c) A licensee must demonstrate compliance as follows:

(1) The licensee must provide proof of insurance required under § 450.9 by:

(i) Certifying to the Office that it has obtained insurance in compliance with the requirements of this part and any applicable license order;

(ii) Filing with the Office one or more certificates of insurance evidencing insurance coverage by one or more insurers under a currently effective and properly endorsed policy or policies of insurance, applicable to licensed reentry activities, on terms and conditions and in amounts prescribed under this part, and specifying policy exclusions;

(iii) In the event of any policy exclusions or limitations of coverage that may be considered usual under § 450.19(c) of this part, or for purposes of implementing the Government's waiver of claims for property damage under 49 U.S.C. 70112(b)(2), certifying that insurance covering the excluded risks is not commercially available at reasonable cost; and

(iv) Submitting to the Office, for signature by the Department on behalf of the United States Government, the waiver of claims and assumption of responsibility agreement required by § 450.17(c) of this part, executed by the licensee and its customer.

(2) Certifications required under this section must be signed by a duly authorized officer of the licensee.

(d) Certificate(s) of insurance required under paragraph (c)(1)(ii) of this section must be signed by the insurer issuing the policy and accompanied by an opinion of the insurance broker that the insurance obtained by the licensee complies with the specific requirements for insurance set forth in this part and any applicable license order.

(e) The licensee must maintain, and make available for inspection by the Office upon request, all required policies of insurance and other documents necessary to demonstrate compliance with this part.

(f) In the event the licensee demonstrates financial responsibility using means other than insurance, as provided under § 450.9(f) of this part, the licensee must provide

proof that it has met the requirements set forth in this part and in a license order issued by the Office.

**§ 450.17 Reciprocal waiver of claims requirements.**

(a) As a condition of each reentry license, the licensee shall comply with reciprocal waiver of claims requirements as set forth in this section.

(b) The licensee shall implement reciprocal waivers of claims with its contractors and subcontractors, its customer(s) and the customer's contractors and subcontractors, and the launch licensee and its contractors and subcontractors and customers, under which each party waives and releases claims against the other parties to the waivers and agrees to assume financial responsibility for property damage it sustains and for bodily injury or property damage sustained by its own employees, and to hold harmless and indemnify each other from bodily injury or property damage sustained by its employees, resulting from reentry activities, including licensed launch activities associated with a particular reentry, regardless of fault.

(c) For each licensed reentry in which the U.S. Government, its agencies, or its contractors and subcontractors is involved in licensed reentry activities or licensed launch activities associated with a particular reentry, or where property insurance is required under § 440.9(d) of this subchapter or § 450.9(d), the Federal Aviation Administration of the Department of Transportation, the licensee, and its customer shall enter into a reciprocal waiver of claims agreement in the form set forth in Appendix B to this part or that satisfies its requirements.

(d) The reentry licensee and its customer, the launch licensee and its customer, and the Federal Aviation Administration of the Department of Transportation on behalf of the United States and its agencies but only to the extent provided in legislation, must

agree in any waiver of claims agreement required under this part to indemnify another party to the agreement from claims by the indemnifying party's contractors and subcontractors arising out of the indemnifying party's failure to implement properly the waiver requirement.

**§ 450.19 United States payment of excess third-party liability claims.**

(a) The United States pays successful covered claims (including reasonable expenses of litigation or settlement) of a third party against the licensee, the customer, and the contractors and subcontractors of the licensee and the customer, and the employees of each involved in licensed reentry activities, the licensee, customer and the contractors and subcontractors of each involved in licensed launch activities associated with a particular reentry, and the contractors and subcontractors of the United States and its agencies, and their employees, involved in licensed reentry activities and licensed launch activities associated with a particular reentry, to the extent provided in an appropriation law or other legislative authority providing for payment of claims in accordance with 49 U.S.C. 70113, and to the extent the total amount of such covered claims arising out of any particular reentry:

(1) Exceeds the amount of insurance required under § 450.9(b); and

(2) Is not more than $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) above that amount.

(b) Payment by the United States under paragraph (a) of this section shall not be made for any part of such claims for which bodily injury or property damage results from willful misconduct by the party seeking payment.

(c) The United States shall provide for payment of claims by third parties for bodily injury or property damage that are payable under 49 U.S.C. 70113 and not covered

by required insurance under § 450.9(b), without regard to the limitation under paragraph (a)(1) of this section, because of an insurance policy exclusion that is usual. A policy exclusion is considered usual only if insurance covering the excluded risk is not commercially available at reasonable rates. The licensee must submit a certification in accordance with § 450.15(c)(1)(iii) of this part for the United States to cover the claims.

(d) Upon the expiration of the policy period prescribed in accordance with § 450.11(a), the United States shall provide for payment of claims that are payable under 49 U.S.C. 70113 from the first dollar of loss up to $1,500,000,000 (as adjusted for inflation occurring after January 1, 1989).

(e) Payment by the United States of excess third-party claims under 49 U.S.C. 70113 shall be subject to:

(1) Prompt notice by the licensee to the Office that the total amount of claims arising out of licensed reentry activities exceeds, or is likely to exceed, the required amount of financial responsibility. For each claim, the notice must specify the nature, cause, and amount of the claim or lawsuit associated with the claim, and the party or parties who may otherwise be liable for payment of the claim;

(2) Participation or assistance in the defense of the claim or lawsuit by the United States, at its election;

(3) Approval by the Office of any settlement, or part of a settlement, to be paid by the United States; and

(4) Approval by Congress of a compensation plan prepared by the Office and submitted by the President.

(f) The Office will:

(1) Prepare a compensation plan outlining the total amount of claims and meeting the requirements set forth in 49 U.S.C. 70113;

(2) Recommend sources of funds to pay the claims; and

(3) Propose legislation as required to implement the plan.

(g) The Office may withhold payment of a claim if it finds that the amount is unreasonable, unless it is the final order of a court that has jurisdiction over the matter.

## APPENDIX A TO PART 450—INFORMATION REQUIREMENTS FOR OBTAINING A MAXIMUM PROBABLE LOSS DETERMINATION FOR LICENSED REENTRY ACTIVITES

Any person requesting a maximum probable loss determination shall submit the following information to the Office, unless the Office has waived a particular information requirement under 14 CFR 450.7(c):

### I. GENERAL INFORMATION

A. Reentry mission description.

1. A description of mission parameters, including:

a. Orbital inclination; and

b. Orbit altitudes (apogee and perigee).

c. Reentry trajectory

2. Reentry flight sequences.

3. Reentry initiation events and the time for each event.

4. Nominal landing location, alternative landing sites and contingency abort sites.

5. Identification of landing facilities, (planned date of reentry), and reentry windows.

6. If the applicant has previously been issued a license to conduct reentry activities using the same reentry vehicle to the same reentry (site) facility, a description of any differences planned in the conduct of proposed activities.

B. Reentry Vehicle Description.

1. General description of the reentry vehicle including dimensions.

2. Description of major systems, including safety systems.

3. Description of propulsion system (reentry initiation system) and type of fuel used.

4. Identification of all propellants to be used and their hazard classification under the Hazardous Materials Table, 49 CFR 172.101.

5. Description of hazardous components.

C. Payload.

1. General description of any payload, including type (e.g., telecommunications, remote sensing), propellants, and hazardous components or materials, such as toxic or radioactive substances.

D. Flight Termination System/ Flight Safety System.

1. Identification of any flight termination system (FTS) or Flight safety System (FSS) on the reentry vehicle, including a description of operations and component location on the vehicle.

**II. FLIGHT OPERATIONS**

A. Identification of reentry site facilities exposed to risk during vehicle reentry and landing.

B. Identification of accident failure scenarios, probability assessments for each, and estimation of risks to Government personnel, individuals not involved in licensed reentry activities, and Government property, due to property damage or bodily injury. The

estimation of risks for each scenario shall take into account the number of such individuals at risk as a result of reentry (flight) and landing of a reentry vehicle (on-range, off-range, and down-range) and specific, unique facilities exposed to risk. Scenarios shall cover the range of reentry trajectories for which authorization is sought in the license application.

C. On-orbit risk analysis assessing risks posed by a reentry vehicle to operational satellites during reentry.

D. Reentry risk analysis assessing risks to Government personnel and individuals not involved in licensed reentry activities as a result of inadvertent or random reentry of the launch vehicle or its components.

E. Nominal and 3-sigma dispersed trajectory in one-second intervals, from reentry initiation through landing or impact. (Coordinate system will be specified on a case by case basis)

F. Three-sigma landing or impact dispersion area in downrange (+/-) and crossrange (+/-) measured from the nominal, and contingency landing or impact target. The applicant is responsible for including all significant landing or impact dispersion constituents in the computations of landing or impact dispersion areas. The dispersion constituents should include, but not be limited to: variation in orbital position and velocity at the reentry initiation time; variation in re-entry initiation time offsets, either early or late; variation in the bodies' ballistic coefficient; position and velocity variation due to winds; and variations in re-entry retro-maneuvers.

G. Malfunction turn data (tumble, trim) for guided (controllable) vehicles. The malfunction turn data shall include the total angle turned by the velocity vector versus turn duration time at one second interval; the magnitude of the velocity vector versus turn

duration time at one second intervals; and an indication on the data where the re-entry body will impact the earth, or breakup due to aerodynamic loads. A malfunction turn data set is required for each malfunction time. Malfunction turn start times shall not exceed four-second intervals along the trajectory.

H. Identification of debris casualty areas and the projected number and ballistic coefficient of fragments expected to result from each failure mode during reentry.

**III. POST-FLIGHT PROCESSING OPERATIONS**

A. General description of post-flight ground operations including overall sequence and location of operations for removal of vehicle and components and processing equipment from the reentry site facility and for handling of hazardous materials, and designation of hazardous operations.

B. Identification of all facilities used in conducting post- flight processing operations.

C. For each hazardous operation:

1. Identification of location where each operation is performed, including each building or facility identified by name or number.

2. Identification of facilities adjacent to location where each operation is performed and exposed to risk, identified by name or number.

3. Maximum number of Government personnel and individuals not involved in licensed reentry activities who may be exposed to risk during each operation. For Government personnel, identification of his or her employer.

4. Identify and provide reentry site facility policies or requirements applicable to the conduct of operations.

**APPENDIX B TO PART 450 - AGREEMENT FOR WAIVER OF CLAIMS AND ASSUMPTION OF RESPONSIBILITY**

THIS AGREEMENT is entered into this day of , by and among [Licensee] (the "Licensee"), [Customer] (the "Customer") and the Federal Aviation Administration of the Department of Transportation, on behalf of the United States Government (collectively, the "Parties"), to implement the provisions of section 450.17(c) of the Commercial Space Transportation Licensing Regulations, 14 CFR Ch. III (the "Regulations").

In consideration of the mutual releases and promises contained herein, the Parties hereby agree as follows:

1. DEFINITIONS

Contractors and Subcontractors means entities described in section 450.3 of the Regulations, 14 CFR 450.3.

Customer means the above-named Customer on behalf of the Customer and any person described in section 450.3 of the Regulations, 14 CFR 450.3.

License means License No. _____ issued on _____, by the Associate Administrator for Commercial Space Transportation, Federal Aviation Administration, Department of Transportation, to the Licensee, including all license orders issued in connection with the License.

Licensee means the Licensee and any transferee of the Licensee under 49 U.S.C. Subtitle IX, ch. 701.

United States means the United States and its agencies involved in Licensed Activities.

Except as otherwise defined herein, terms used in this Agreement and defined in 49 U.S.C. Subtitle IX, ch. 701--Commercial Space Launch Activities, or in the Regulations, shall have the same meaning as contained in 49 U.S.C. Subtitle IX, ch. 701, or the Regulations, respectively.

2. WAIVER AND RELEASE OF CLAIMS

(a) Licensee hereby waives and releases claims it may have against Customer and the United States, and against their respective Contractors and Subcontractors, for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

(b) Customer hereby waives and releases claims it may have against Licensee and the United States, and against their respective Contractors and Subcontractors, for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

(c) The United States hereby waives and releases claims it may have against Licensee and Customer, and against their respective Contractors and Subcontractors, for

Property Damage it sustains, and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims it would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) and (e) or sections 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

3. ASSUMPTION OF RESPONSIBILITY

(a) Licensee and Customer shall each be responsible for Property Damage it sustains and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault. Licensee and Customer shall each hold harmless and indemnify each other, the United States, and the Contractors and Subcontractors of each Party, for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault.

(b) The United States shall be responsible for Property Damage it sustains, and for Bodily Injury or Property Damage sustained by its own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims it would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) and (e) or sections 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

4. EXTENSION OF ASSUMPTION OF RESPONSIBILITY AND WAIVER

(a) Licensee shall extend the requirements of the waiver and release of claims, and the assumption of responsibility, hold harmless, and indemnification, as set forth in paragraphs 2(a) and 3(a), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Customer and the United States, and against the respective Contractors and Subcontractors of each, and to agree to be responsible, for Property Damage they sustain and to be responsible, hold harmless and indemnify Customer and the United States, and the respective Contractors and Subcontractors of each, for Bodily Injury or Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault.

(b) Customer shall extend the requirements of the waiver and release of claims, and the assumption of responsibility, hold harmless, and indemnification, as set forth in paragraphs 2(b) and 3(a), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Licensee and the United States, and against the respective Contractors and Subcontractors of each, and to agree to be responsible, for Property Damage they sustain and to be responsible, hold harmless and indemnify Licensee and the United States, and the respective Contractors and Subcontractors of each, for Bodily Injury or Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault.

(c) The United States shall extend the requirements of the waiver and release of claims, and the assumption of responsibility as set forth in paragraphs 2(c) and 3(b), respectively, to its Contractors and Subcontractors by requiring them to waive and release all claims they may have against Licensee and Customer, and against the respective

Contractors and Subcontractors of each, and to agree to be responsible, for any Property Damage they sustain and for any Bodily Injury or Property Damage sustained by their own employees, resulting from Licensed Activities, regardless of fault, to the extent that claims they would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) and (e) or sections 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9(c) and (e) or 14 CFR 450.9(c) and (e).

5. INDEMNIFICATION

(a) Licensee shall hold harmless and indemnify Customer and its directors, officers, servants, agents, subsidiaries, employees and assignees, or any or them, and the United States and its agencies, servants, agents, subsidiaries, employees and assignees, or any or them, from and against liability, loss or damage arising out of claims that Licensee's Contractors and Subcontractors may have for Property Damage sustained by them and for Bodily Injury or Property Damage sustained by their employees, resulting from Licensed Activities.

(b) Customer shall hold harmless and indemnify Licensee and its directors, officers, servants, agents, subsidiaries, employees and assignees, or any or them, and the United States and its agencies, servants, agents, subsidiaries, employees and assignees, or any of them, from and against liability, loss or damage arising out of claims that Customer's Contractors and Subcontractors, or any person on whose behalf Customer enters into this Agreement, may have for Property Damage sustained by them and for

Bodily Injury or Property Damage sustained by their employees, resulting from Licensed Activities.

(c) To the extent provided in advance in an appropriations law or to the extent there is enacted additional legislative authority providing for the payment of claims, the United States shall hold harmless and indemnify Licensee and Customer and their respective directors, officers, servants, agents, subsidiaries, employees and assignees, or any of them, from and against liability, loss or damage arising out of claims that Contractors and Subcontractors of the United States may have for Property Damage sustained by them, and for Bodily Injury or Property Damage sustained by their employees, resulting from Licensed Activities, to the extent that claims they would otherwise have for such damage or injury exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) and (e) or 450.9(c) and (e), respectively, of the Regulations, 14 CFR 440.9 (c) and (e) or 14 CFR 450.9(c) and (e).

6. ASSURANCES UNDER 49 U.S.C. 70112(e)

Notwithstanding any provision of this Agreement to the contrary, Licensee shall hold harmless and indemnify the United States and its agencies, servants, agents, employees and assignees, or any of them, from and against liability, loss or damage arising out of claims for Bodily Injury or Property Damage, resulting from Licensed Launch Activities, regardless of fault, except to the extent that: (i) as provided in section 7(b) of this Agreement, claims result from willful misconduct of the United States or its agents; (ii) claims for Property Damage sustained by the United States or its Contractors

and Subcontractors exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(e) or 450.9(e) of the Regulations (14 CFR 440.9(e) or 450.9(e)); (iii) claims by a Third Party for Bodily Injury or Property Damage exceed the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) or 450.9(c) of the Regulations (14 CFR 440.9(c) or 450.9(c)), and do not exceed $1,500,000,000 (as adjusted for inflation after January 1, 1989) above such amount, and are payable pursuant to the provisions of 49 U.S.C. 70113 and sections 440.19 or 450.19 of the Regulations (14 CFR 440.19 or 450.19); or (iv) Licensee has no liability for claims exceeding $1,500,000,000 (as adjusted for inflation after January 1, 1989) above the amount of insurance or demonstration of financial responsibility required under sections 440.9(c) or 450.9(c) of the Regulations (14 CFR 440.9(c) or 450.9(c)).

7. MISCELLANEOUS

(a) Nothing contained herein shall be construed as a waiver or release by Licensee, Customer or the United States of any claim by an employee of the Licensee, Customer or the United States, respectively, including a member of the Armed Forces of the United States, for Bodily Injury or Property Damage, resulting from Licensed Activities.

(b) Notwithstanding any provision of this Agreement to the contrary, any waiver, release, assumption of responsibility or agreement to hold harmless and indemnify herein shall not apply to claims for Bodily Injury or Property Damage resulting from willful misconduct of any of the Parties, the Contractors and Subcontractors of any of the Parties, and in the case of Licensee and Customer and the Contractors and

Subcontractors of each of them, the directors, officers, agents and employees of any of the foregoing, and in the case of the United States, its agents.

(c) In the event that more than one customer is involved in Licensed Activities, references herein to Customer shall apply to, and be deemed to include, each such customer severally and not jointly.

(d) This Agreement shall be governed by and construed in accordance with United States Federal law.

IN WITNESS WHEREOF, the Parties to this Agreement have caused the Agreement to be duly executed by their respective duly authorized representatives as of the date written above.

LICENSEE

By:

Its:

CUSTOMER

By:

Its:

DEPARTMENT OF TRANSPORTATION

Issued in Washington, DC on 24 September 1999

/S/

Patricia G. Smith
Associate Administrator for Commercial Space Transportation